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July 23, 2012

SUBMITTED VIA EMAIL
(ORD.Docket@epa.gov)

Lisa Jackson, Administrator
U.S. Environmental Protection Agency
Office of Environmental Information
(OEI) Docket (Mail Code: 2822T)
1200 Pennsylvania Ave., N.W.
Washington, DC 20460

Re: Comments on An Assessment of Potential Mining Impacts on Salmon Ecosystems of Bristol Bay, Alaska (Docket # EPA-HQ-ORD-2012-0276)

Dear Administrator Jackson:

I. Introduction

Cook Inletkeeper (Inletkeeper) is a nonprofit organization formed in 1995 to protect the Cook Inlet watershed and the life it sustains. Because large-scale mining activities in the Bristol Bay watershed have considerable potential to impact the Cook Inlet watershed, and because of the dangerous precedent posed by large-scale mining in and around wild Alaskan salmon habitat, we have a strong interest in EPA's Bristol Bay Watershed Assessment. Please accept these comments on the above-referenced matter on behalf of Inletkeeper and its more than 1200 Alaskan members and supporters.

II. Comments

A. Salmon Stream Protection & Restoration

1. Mineral Closing Order

EPA should consider the exhaustive review conducted by the Alaska Department of Natural Resources in 1984 for Bristol Bay Area Plan Mineral Order No. 393 (attached). This document goes to great lengths to highlight the social and economic importance of wild Alaska salmon, and it details the elevated risks posed to wild salmon from mining activities. In response, the Order closes mineral entry on over 210,000 acres of salmon and riparian habitat.

2. Mineral Leasehold Location Order

In 1984, the Alaska DNR found the salmon and other resources in the Bristol Bay watershed so valuable it chose to require the enhanced control and protection of a leasehold system instead of traditional mining claims throughout the region. DNR's Mineral Leasehold Order No. 1 (attached) provides a strong technical and historical backdrop on the importance of wild salmon and other resources in the Bristol Bay watershed, and supports EPA's Assessment on the heightened risks posed to fish and wildlife by large-scale mining activities.

3. Salmon Stream Restoration

Despite claims by various mining companies, it remains technically and scientifically impossible to restore wild salmon habitat to its pre-mining functions and values after open pit, strip or other highly intensive mining techniques. Cook Inletkeeper has spent the past five years looking for examples of successful hard- and soft-rock restoration examples involving wild salmon, and we have found none.[1] Accordingly, in its analysis under section 404 of the Clean Water Act, EPA should recognize the permanent, adverse impacts to salmon habitat that will flow from large-scale mining operations.

B. Climate Change, Salmon Habitat & Hydrologic Impacts

1. Climate Threats to Salmon

The scientists with the International Union for the Conservation of Nature (IUCN) recognize dramatic impacts to wild salmon from increasing temperatures: "Physical changes to freshwater ecosystems resulting from climate change will degrade and diminish available habitat, reduce reproductive success and jeopardize migration."[2] For the past eight years, Inletkeeper has used in-stream dataloggers to record temperatures in non-glacial anadromous systems throughout the Cook Inlet watershed. The data show alarming warming trends, with routine violations of the State of Alaska water quality standards designed to protect migrating and spawning salmon.[3] EPA should expect to find similar results in the Bristol Bay watershed, and if so, it should embrace a precautionary approach that recognizes the inherent complexities and unknowns associated with managing salmon habitat in a changing climate.

2. Hydrology & Climate

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[1] *See, e.g.,* Expert comments submitted to Inletkeeper in 2011 by Dr. Margaret Palmer, Professor and Director, Chesapeake Biological Laboratory, University of Maryland (available at: http://inletkeeper.org/resources/contents/dr-palmer-expert-comments-on-denial-of-unsuitable-lands-petition-ulp-by-adnr). Additional relevant materials can be found at: http://chuitna.org/expert-comments/

[2] IUCN Red List, Salmon & Climate Change: Fish in hot water. Fact Sheet. 2009 (available at: http://cmsdata.iucn.org/downloads/fact_sheet_red_list_salmon.pdf)

[3] *See* Sue Mauger, Stream Temperature Monitoring Network for Cook Inlet Salmon Streams 2008-2010 (2011) (available at: http://inletkeeper.org/resources/contents/stream-temperature-report).

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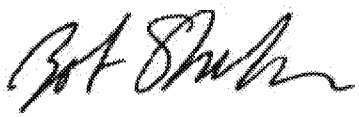
Not surprisingly, surface and groundwater hydrology will change considerably as temperatures change throughout Alaska. To assess the potential impacts of climate change on the Chuitna watershed hydrologic system on the West side of Cook Inlet, researchers developed a 3-dimensional integrated conceptual flow model of the surface and subsurface flow system using available geology, soils, climate, surface and groundwater and vegetation data. The model predicts that for even minimum increases in air temperature and precipitation, significant changes in hydrology are projected to occur in the Chuitna watershed during the 2080 to 2100 time period.[4] EPA should consider similar models and data in the Bristol Bay watershed when undergoing its section 404 analysis.

III. Conclusion

EPA's Assessment reinforces reviews by the Alaska DNR and others that large-scale mining in the Bristol Bay watershed will have significant, permanent, adverse impacts on wild Alaska salmon. Inletkeeper's research has found no examples where mined-through salmon habitat has been successfully restored, and as climate change unfolds, wild salmon populations will become increasingly stressed, requiring enhanced habitat protections. As a result, Cook Inletkeeper urges you to initiate action now under Section 404(c) to proactively protect the Bristol Bay watershed and the countless families and communities that rely on healthy, wild salmon from large-scale mining projects – including the Pebble Mine.

Thank you for considering these comments and please do not hesitate to contact me at 907.299.3277 or bob@inletkeeper.org.

Very truly yours,



Bob Shavelson
Inletkeeper

[4] *See* Robert Prucha, Ph.D., Jason Leppi, Stephanie McAfee, Ph.D. & Wendy Loya, Ph.D., Integrated Effects of Climate Change in the Chuitna Watershed, Alaska (2011) (available at: http://alaska.fws.gov/fisheries/fieldoffice/anchorage/pdf/Summary%20Climate%20Effects%20Chuitna%20Hydrology%20Revised%200412.pdf).

EPA-7609-0009626_00003

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF LAND AND WATER MANAGEMENT

Northcentral District	XX Southcentral District	Southeastern District
4420 Airport Way	Pouch 7-005	230 S. Franklin, Room 407
Fairbanks, Alaska 99701	Anchorage, Alaska 99510	Juneau, Alaska 99801
(907) 479-2243	(907) 276-2653	(907) 465-3400

MINERAL LEASEHOLD LOCATION ORDER NO. 1

1.0 ORDER RESTRICTING TO LEASEHOLD LOCATION

After the effective date of this order (see paragraph 5), and unless otherwise closed to mineral entry, rights to locatable minerals in the land covered by this order may be acquired only under the leasehold location system, AS 38.05.205, and may not be acquired by locating a mining claim under AS 34.05.195.

2.0 THE LAND SUBJECT TO THE TERMS OF THIS ORDER IS DESCRIBED AS FOLLOWS: (Attach additional sheets as necessary.)

See attachment A.

3.0 AUTHORITY FOR THIS ORDER

This order is issued under the authority granted by AS 38.05.185 to the Department of Natural Resources for the State of Alaska.

SOA 015706

4.0 FINDINGS AND DETERMINATIONS

The following findings and determinations are made: (Only those findings and determinations which are preceded by a checkmark in the box are applicable to this order.)

Completed
GRAPHIC RECORD NOTED 1/13/94
DATE

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[XX] 4.1 The land described in paragraph 2.0 is found and determined to be subject to potential use conflicts which require that mining be allowed only under written leases issued under AS 38.05.205. These potential use conflicts include, but are not necessarily limited to, the following: (Attach additional sheets if necessary.)

See Attachment B and the Bristol Bay Area Plan, September 1984, Alaska Department of Natural Resources, Division of Land and Water Management, Anchorage, Alaska.

[ ] 4.2 The land described in paragraph 2.0 is found and determined to have been mineral in character at the time of state selection.

5.0 EFFECTIVE DATE

This order is effective as of:

[XX] 5.1 September 13, 1984 (thirty days after the first public notice of this action).

[ ] 5.2 The following (later) date: _____.

Dated: 9-12-84

Tom Hawkins
Director, Division of Land & Water Management

Dated: 9-13-84

for Director, Division of Mining

Approved and ratified by:

COMMISSIONER, DEPARTMENT OF NATURAL RESOURCES

Dated: 9-13-84

SOA 015707

FINDINGS OF THE COMMISSIONER
BRISTOL BAY AREA PLAN
AS 38.05.185(a)

RECEIVED
SEP 17 1984
DIVISION OF MINING
ANCHORAGE, ALASKA

The Bristol Bay Area Plan (BBAP), developed in accordance with appropriate state statutes, identifies 1.9 million acres of state land in the upper Mulchatna and eastern Iliamna Lake drainages to be managed for fish and wildlife habitat and harvest, recreation, and minerals exploration and development. Due to potential use conflicts between these various significant land uses, the plan calls for management of these state lands under the leasehold location mining program. (See Attachment B, Justification for Leasehold Location Mining.)

Commercial harvest of salmon is the major economic industry in the Bristol Bay region. The average ex-vessel value for all salmon catches (all species) in the BBAP study area (1977-1982) have exceeded $150 million annually, with first wholesale value surpassing $250 million in 1982. Recreational activities, which includes sport fishing as a major component, contribute an estimated $25 million annually to the Bristol Bay economy. The value of the subsistence harvest of fish cannot be measured in standard monetary terms. An estimation can be made of the replacement food cost of the subsistence harvest if the harvest had to be replaced with food shipped in from Anchorage. Preliminary estimates for the local food replacement cost of the 1982 subsistence salmon harvest range from $2 to $4 million. Habitat requirements essential for successful salmon spawning, egg, and fry development are clear, cool, well oxygenated stream water and streambed gravel that is free of sediment, highly permeable, and stable. The continued propagation and production of Bristol Bay salmon is essential to a strong regional economy in Bristol Bay and is a substantial contributor to the state economy. Therefore, the propagation and production of Bristol Bay salmon constitutes a significant surface use of the Bristol Bay area.

Use of these state lands by other fish (particularly grayling, rainbow trout, and arctic char) and wildlife (particularly caribou, moose, and brown bear) and the subsistence and recreational harvest thereof, are also significant surface uses of state land.

Mineral development in the upper Mulchatna and eastern Iliamna Lake drainages has the potential for surface use conflicts with the fish and wildlife resources, especially with the propagation and production of salmon. These conflicts could also jeopardize the economy of the Bristol Bay region. Mining in these areas has the potential to negatively affect salmon spawning and rearing habitat and degrade water quality by the production of excessive sediment loads. Turbidity resulting from increased sediment loads can effectively hinder fish surveys and disrupt management of the entire fishery.

It is my finding that the best interest of the state and its residents are served by the restriction of those portions of the Bristol Bay area (as identified in the Bristol Bay Area Plan and in Attachment A) to leasehold location mining under the locatable mineral leasing and mining laws of the State of Alaska. Mineral Leasehold Location Order #1.

Esther C. Wunnicke
Commissioner
Department of Natural Resources

Sept 13, 1984
Date

SOA 015708

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Attachment A
Description of Area Bristol Bay Leasehold Location Order

Township/Range	Estimated Acreage[1]	Status[2]
T.9N., R.30W. SM.	20,000	Patented or Tentatively Approved
T.9N., R.31W. SM.		
Sec's. 1-18	10,480	Patented or Tentatively Approved
Sec's. 19-36	11,520	Patented or Tentatively Approved
T.9N., R.32W. SM.	12,000	Patented or Tentatively Approved
T.9N., R.33W. SM.	1,000	Patented or Tentatively Approved
T.8N., R.30W. SM.	22,825	Patented or Tentatively Approved
T.8N., R.31W. SM.	22,825	Patented or Tentatively Approved
T.8N., R.32W. SM.		
Sec's. 1-24	15,360	Patented or Tentatively Approved
Sec's. 25-36	7,465	Patented or Tentatively Approved
T.8N., R.33W. SM.	22,000	Patented or Tentatively Approved
T.8N., R.34W. SM.	18,000	Patented or Tentatively Approved
T.8N., R.35W. SM.	5,000	Patented or Tentatively Approved
T.7N., R.29W. SM.	22,886	Patented or Tentatively Approved
T.7N., R.30W. SM.	22,886	Patented or Tentatively Approved
T.7N., R.31W. SM.	22,886	Patented or Tentatively Approved
T.7N., R.32W. SM.	22,886	Patented or Tentatively Approved
T.7N., R.33W. SM.	22,886	Patented or Tentatively Approved
T.7N., R.34W. SM.	22,886	Patented or Tentatively Approved
T.7N., R.35W. SM.	18,000	Patented or Tentatively Approved
T.6N., R.30W. SM.	22,948	Patented or Tentatively Approved
T.6N., R.31W. SM.	22,948	Patented or Tentatively Approved
T.6N., R.32W. SM.	22,948	Patented or Tentatively Approved
T.6N., R.33W. SM.	22,948	Patented or Tentatively Approved

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T.6N., R.34W. SM.	22,948	Patented or Tentatively Approved
T.6N., R.35W. SM.	20,000	Patented or Tentatively Approved
T.6N., R.36W. SM.	7,000	Patented or Tentatively Approved
T.5M., R.30W. SM.	23,009	Patented or Tentatively Approved
T.5N., R.31W. SM.	23,009	Patented or Tentatively Approved
T.5N., R.32W. SM.	23,009	Patented or Tentatively Approved
T.5N., R.33W. SM.	23,009	Patented or Tentatively Approved
T.5N., R.34W. SM.	23,009	Patented or Tentatively Approved
T.5N., R.35W. SM.	23,009	Patented or Tentatively Approved
T.5N., R.36W. SM.	21,000	Patented or Tentatively Approved
T.5N., R.37W. SM.	19,000	Patented or Tentatively Approved
T.4N., R.31W. SM.	11,414	Selected
T.4N., R.32W. SM.	22,828	Patented or Tentatively Approved
T.4N., R.33W. SM.	22,828	CIRI
T.4N., R.34W. SM.	22,828	CIRI
T.4N., R.35W. SM.	22,828	CIRI
T.4N., R.36W. SM.	22,828	CIRI
T.4N., R.37W. SM. Sec's. 1-3, 10-15, 22-27, 34-36	11,414	Patented or Tentatively Approved
T.4N., R.38W. SM.*	22,828	Patented or Tentatively Approved
T.3N., R.31W. SM.	11,444	Patented or Tentatively Approved
T.3N., R.32W. SM.	22,888	Patented or Tentatively Approved
T.3N., R.33W. SM.	22,888	Patented or Tentatively Approved
T.3N., R.34W. SM.	22,250	CIRI
T.3N., R.35W. SM.	22,888	CIRI
T.3N., R.36W. SM.	22,888	CIRI

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T.3N., R.37W. SM. Sec's. 1-3, 10-15, 22-27, 34-36	11,445	Patented or Tentatively Approved
T.2N., R.31W. SM.* Sec's. 5-8, 18	3,200	Patented or Tentatively Approved
T.2N., R.32W. SM.	22,949	Patented or Tentatively Approved
T.2N., R.33W. SM.	22,949	Patented or Tentatively Approved
T.2N., R.34W. SM.	22,949	CIRI
T.2N., R.35W. SM.	22,949	CIRI
T.2N., R.36W. SM.	22,949	CIRI
T.2N., R.37W. SM. Sec's. 1-3, 10-15, 22-27, 34-36	11,475	Patented or Tentatively Approved
T.1N., R.34W. SM.	23,010	Selected
T.1N., R.35W. SM.	23,010	Selected
T.1N., R.36W. SM.	23,010	CIRI
T.1N., R.37W. SM. Sec's. 1-3, 10-15, 22-27, 34-36	11,505	Patented or Tentatively Approved
T.1S., R.35W. SM.	22,831	Selected
T.1S., R.36W. SM.	22,831	Selected
T.1S., R.37W. SM. Sec's. 1-3, 10-15, 22-27, 34-36	11,416	CIRI
T.2S., R.26W. SM.	1,500	Selected
T.2S., R.27W. SM.	1,500	Selected
T.2S., R.28W. SM.	500	Selected
T.2S., R.29W. SM.* Sec's. 19, 20, 25-27, 29(E 1/2), 30, 31, 32(W 1/2), 34(E 1/2), 35, 36	5,240	Selected
T.2S., R.30W. SM.*	800	Selected
T.2S., R.33W. SM.*	18,000	Selected

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T.2S., R.34W. SM.*	18,000	Selected
T.2S., R.35W. SM.*	11,415	Selected
T.2S., R.36W. SM.*	12,800	Selected
T.2S., R.37W. SM.* Sec's. 1, 2, 11-14, 24, 25	5,200	CIRI
T.3S., R.25W. SM.	19,000	Selected
T.3S., R.26W. SM.	22,000	Selected
T.3S., R.27W. SM.	18,000	Selected
T.3S., R.28W. SM.*	18,500	Selected
T.3S., R.29W. SM.* Sec's. 1, 2, 3(E 1/2), 6, 7, 10-15, 18-36	18,790	Selected
T.3S., R.30W. SM.	14,000	Selected
T.3S., R.31W. SM.	4,000	Selected
T.3S., R.34W. SM. Sec's. 13, 24, 25, 36	2,560	Selected
T.4S., R.24W. SM.	8,000	Selected
T.4S., R.25W. SM.	22,000	Selected
T.4S., R.26W. SM.	10,880	Selected
T.4S., R.27W. SM.	8,320	Selected
T.4S., R.29W. SM.	13,440	Selected
T.4S., R.30W. SM.	19,200	Selected
T.4S., R.31W. SM. Sec's. 1-10, 15-21	10,880	Selected
T.4S., R. 32W. SM.	3,840	Selected
T.4S., R. 33W. SM. Sec's. 3-10, 15-18, 20, 29	8,960	Selected
T.4S., R. 34W. SM. Sec's. 1, 12	1,280	Selected

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T.6S., R.26W. SM.	3,500	Selected
T.6S., R.27W. SM.*	22,000	Selected
T.6S., R.28W. SM.		
Sec's. 1-34	19,720	Selected
Sec's. 35, 36	1,280	Selected
T.6S., R.29W. SM.	12,800	Selected
T.6S., R.30W. SM.	11,446	Selected
T.6S., R.31W. SM.	3,500	Selected
T.7S., R.27W. SM.	10,000	CIRI/Selected
T.7S., R.28W. SM.*		
Sec's. 3(W 1/2), 4-9, 10(NW 1/4), 16-19, 21(NW 1/4), 24, 25	10,180	CIRI/Selected
T.7S., R.29W. SM.	22,925	CIRI/Selected
T.7S., R.30W. SM.	14,080	Selected
T.7S., R.31W. SM.*	5,760	Selected
T.8S., R.28W. SM.*		
Sec's. 1-3, 4(W 1/2), 10-16, 19-36	9,120	Selected
T.8S., R.29W. SM.	23,011	CIRI/Selected
T.8S., R.30W. SM.		
Sec's. 1-11	5,200	Selected
T.9S., R.29W. SM.	6,000	CIRI/Selected
T.9S., R.30W. SM.	22,836	CIRI/Selected
T.9S., R.31W. SM.	14,080	CIRI/Selected
T.9S., R.32W. SM.	10,240	Selected
T.9S., R.33W. SM.*	3,840	Selected
T.9S., R.34W. SM.*	10,240	Selected
T.9S., R.35W. SM.		
Sec's. 2-36	18,096	Selected
T.9S., R.36W. SM.	9,078	Selected
T.10S., R.29W. SM.*	500	Selected

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T.10S., R.30W. SM.*	12,000	Selected
T.10S., R.31W. SM.	22,895	Selected
T.10S., R.32W. SM.	15,360	Selected
T.10S., R.33W. SM.	14,080	Selected
T.10S., R.34W. SM.	22,500	Selected
T.10S., R.35W. SM.	20,300	Selected
T.10S., R.36W. SM.	19,050	Selected
T.11S., R.30W. SM.	2,000	Selected
T.11S., R.31W. SM.	7,000	Patented or Tentatively Approved
T.11S., R.32W. SM.	5,000	Patented or Tentatively Approved
T.11S., R.34W. SM.	5,000	Selected

[1] Estimated acreages are estimates only, although care was taken to make them as accurate as possible. Most of the acreage figures were taken (or derived from) a computerized list of acreages for all townships in the state. The list, dated 9-11-79, was apparently generated by BLM from protraction diagrams and subsequently included in DNR's Resource Assessment System.

[2] "CIRI" refers to lands identified for state ownership under the Cook Inlet exchange pursuant to Section 12, ANCSA Omnibus Appendix DII, E, F. (See Terms and Conditions for Land Consolidation and Management in the Cook Inlet Area, dated 12-10-75 and clarified 8-13-76.)

SOA 015714

Attachment B

JUSTIFICATION FOR LEASEHOLD LOCATION MINING ON LAND IN THE UPPER MULCHATNA RIVER AND EASTERN ILIAMNA LAKE DRAINAGES

BACKGROUND:

FISH AND WILDLIFE USE

The Bristol Bay salmon fishery is, and historically has been, the most valuable economic resource in the Bristol Bay region; providing a major portion of all the salmon harvested in the State of Alaska and the world annually. Bristol Bay area residents rely heavily on this salmon resource to support their livelihood and economy through commercial, sport, and subsistence fishing activities. The existence and future success of the Bristol Bay salmon fishery depends on the maintenance of anadromous stream habitat for salmon spawning and rearing. Essential conditions for successful salmonid spawning, egg, and fry development are clear, cool, well-oxygenated water, and gravel that is free of sediment, highly permeable, and stable. Salmon are a renewable resource and the continued propagation and production of Bristol Bay salmon for commercial, sport, and subsistence harvest constitutes a significant surface use of stream waters and stream bed gravel in the Bristol Bay area. Through maintenance of water quality, stream habitat, and fishery management practices, the Bristol Bay salmon fishery should continue to prosper in the future and contribute to the regional and state economy. Other fish populations, notably rainbow trout, grayling and arctic char, are sought by sport fishermen from around the nation and world. The Bristol Bay recreational industry, which is based predominantly on sport fishing, is valued at more than $25 million annually.

Other wildlife which are important for subsistence and recreational harvest (including commercial guiding) are caribou, moose, and brown bear. Most of the anadromous streams east of Iliamna Lake and in the Upper Mulchatna provide essential bear feeding habitat, as salmon are the primary food source for brown bears. The Koksetna River drainage and the Bonanza Hills in the upper Mulchatna drainage are essential wintering and calving grounds for much of the Mulchatna caribou herd, estimated at 26,000 caribou. The Upper Mulchatna and areas east of Iliamna Lake also contain substantial areas of essential moose wintering habitat. Maps showing these essential habitats are found at the end of Attachment B.

Fish and wildlife resources have long been recognized as a significant surface use in the Bristol Bay region. Both the Alaska Legislature, when it established Wood-Tikchik State Park, and the U.S. Congress, when it established Katmai and Lake Clark National Parks and Preserves and the Becharof, Alaska Peninsula, and Togiak National Wildlife Refuges, recognized the high value of the region's fish and wildlife resources. Potential conflicts between the fish and wildlife resources, especially the salmon fishery, and mining were also recognized. These parks and refuges were closed to new mineral entry as a result of state and federal legislation.

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The Alaska Legislature further recognized the significance of the Bristol Bay salmon fishery in 1971 with the establishment of the Bristol Bay Fisheries Reserve which prohibits surface entry for oil and gas development in shore and submerged lands.

The potential conflict between fish and wildlife resources and mining does not stop at the administrative boundary of a park or refuge. Fish and wildlife resources are found throughout the Bristol Bay area, utilizing habitat downstream and adjacent to these parks and refuges. State lands in the upper Mulchatna and eastern Iliamna Lake drainages subject to leasehold location have similar potential for conflicts between surface uses and subsurface uses. Although adjacent to Lake Clark National Park and Preserve and Katmai National Park and Preserve, these state lands should remain available for mineral exploration and potential development under leasehold location mining.

COMMERCIAL SALMON HARVEST

The Bristol Bay commercial salmon fishery dates back to 1884, and remains today as the basic factor in the culture and economy of the area. The Bristol Bay Area Plan study area includes all of the Bristol Bay, Alaska Peninsula, and Chignik fishery management units as identified by the Alaska Department of Fish and Game.

Five species of Pacific salmon are indigenous to the Bristol Bay study area with sockeye salmon being most important commercially. The average ex-vessel value for salmon catches (all species) in the entire Bristol Bay study area (1977-1982) have exceeded $150 million annually with the first wholesale value surpassing $250 million in 1982. In 1983, a record commercial catch of more than 39 million sockeye salmon from the Bristol Bay fishery management unit and the north side of the Alaska Peninsula was recorded with an ex-vessel value in excess of $145 million for that species alone.

An estimated 3,000 limited entry fishing permits were issued for the Bristol Bay, Chignik, and Alaska Peninsula purse seine, drift gill net, and set gill net salmon fisheries in 1982. Approximately 67% of these licensed gear holders are Alaska residents, and 70% of these are Bristol Bay residents. More than 7,700 commercial fishermen are employed in the fishery during the season. In addition, twelve shore-based canneries in Bristol Bay employ more than 2,000 cannery workers each season with floating processors employing an additional 700 workers. In addition, air freighting of fresh salmon, for processing elsewhere, is also a substantial enterprise, particularly during high production years. On the average, more than 10,000 people are seasonally employed by the Bristol Bay salmon fishery.

RECREATION/SPORT FISHING

The Iliamna Lake and Nushagak-Mulchatna areas rank among the finest sport fishing and hunting areas in the world. The Iliamna Lake-Kvichak River is designated by the Alaska Board of Fisheries as the Bristol Bay Wild Trout

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Area. Recreation, including sport fishing, has been recognized as a component of the Bristol Bay economy for over 50 years. At present, the recreational industry in the Bristol Bay area is comprised of three components: lodges, guides, and air taxi operators. Most air taxi operators draw their business from the lodges and guides. Approximately 50 to 60 lodges operated in Bristol Bay during 1983. Most lodges are geared for sport fishing activities. Many of these lodges are located near the area proposed for leasehold location and most other lodges take clients to these areas. Approximately two-thirds of the lodge clients were foreign, with the majority of the remaining clients being non-Alaskans. The estimated cost for lodging and fishing at a typical Bristol Bay fishing lodge ranges from $1,500 to $3,500 per person, per week (Nebesky 1984). The 1982 State Guide Register recorded 189 sport fishing and hunting guides in the Bristol Bay area. About 50 registered fishing guides work for the lodges and another 25 operate fly-out float fishing trips on Bristol Bay rivers. Guided fishing trips in Bristol Bay are estimated to average $1,400 per person, per trip (Nebesky 1984). Nonguided independent fishing trips are becoming increasingly popular in Bristol Bay. An estimated 750 to 1,000 persons (mostly Alaskans) take nonguided float-fishing trips in Bristol Bay each year. The Mulchatna, Chilikadrotna, Copper, and Gibralter rivers are among the regions more popular areas used for float trips. The local economic affect of nonguided fishing tours accrues primarily to air taxi operators (Nebesky 1984). Overall, the Bristol Bay recreation industry, of which sport fishing is a major component, produces in excess of $25 million annually. Of this amount, an estimated $6.7 million is earned by Bristol Bay residents, $16.3 million is earned by Alaskans outside of Bristol Bay, and $2 million is tied to nonresident wages (Nebesky 1984).

SUBSISTENCE SALMON HARVEST

The subsistence harvest of fish and wildlife is essential to the way of life in Bristol Bay communities, regardless of the birthplace, ethnic origin, or economic status of the area residents. The subsistence harvest of salmon (all species) in the Bristol Bay study area averages about 176,000 salmon per year (1973-1982). In 1982, an estimated 1,000 subsistence permit holders harvested more than 169,000 salmon for personal consumption in the Bristol Bay study area. Taking into consideration the average weights of the different salmon species and the percentage of usable food weight per salmon, the 1982 subsistence harvest figures translate into approximately 821 pounds of dressed out salmon per family or subsistence permit holder in the Bristol Bay study area.

The behavioral, social, and cultural values associated with the subsistence harvest cannot be measured in standard monetary terms. However, an estimation can be made of the local food replacement cost of the subsistence salmon harvest if the harvest had to be replaced with similar food or a protein equivalent purchased and shipped in from Anchorage or Dillingham. Methodology used in determining the local food replacement cost of the subsistence harvest is still being refined. Preliminary estimates for the local food replacement cost of the 1982 subsistence salmon harvest range from $2 to $4 million.

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MINING

Presently, no hardrock surface mining production is occurring in the Bristol Bay region. A small amount of exploration on state lands is occurring in the region. Native Corporations are also exploring for minerals on their lands. Exploration for hardrock minerals and instream placer mining are a minor component of the Bristol Bay economy when compared with fishery resources. Only eight operating permits were granted for placer operations in the Bristol Bay study area in 1983. Of those eight placer operations, only one (Bonanza Creek) is located within the area proposed for leasehold locations. The estimated 1982 gold production of the eight placer operations within the Bristol Bay study area is 9,500 ounces, valued at approximately $3.8 million (T. Bundtzen, DGGS, 1983, Pers. Comm.). Most of this mining activity occurred in the northwestern portion of the BBAP study area near Nyac and Goodnews Bay. Nebesky et al. (1983) estimates that placer mining operations in the entire Bristol Bay study area seasonally employed about 100 persons in 1982, a peak year for mining and gold prices. The estimated 1982 exploration expenditures for all lode type deposits of precious metals and base metals in the Bristol Bay study area was $4.3 million.

Mineral terrane data show favorable potential for certain hardrock and placer deposits in the drainages of the upper Mulchatna and eastern Iliamna Lake areas. Both of these areas show potential for gold, silver, copper, tin, and molybdenum lode type deposits (BBCMP, 1984). The mountainous area around eastern Iliamna Lake has the highest density of historic known mineral prospects and deposits in the study area. Recently, this area has received renewed exploration activity. The Anaconda Minerals Company has announced a new precious metal hardrock mineral discovery at Johnson River, east of Iliamna Lake, in the Cook Inlet drainage. Native corporations in the region, particularly the Bristol Bay Native Corporation, have been assessing the mineral resources of their lands in these areas. This and other mineral activity in the area will probably draw additional activity due to these favorable results.

EFFECTS OF MINING

The severity of the impacts generated by hardrock mining on fish and wildlife resources depends to a considerable degree on the location of the deposit to be mined and the effectiveness of steps taken to mitigate impacts before, during, and after mineral production. General impacts associated with hardrock mining activities, including surface mining, include the following:

1. Water Quality Impacts

   - Potentially increased sediment loads in the streams from increased surface runoff

   - Heavy metals and other toxic substances used in some mineral extraction methods, introduced to the streams from mine drainage

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- Potential for increased acidity in the streams from introduced mining leachates

2. Upland Impacts

   - Alteration or destruction of habitat from removal of overburden

   - Construction of roads and on-site facilities which disturbs habitat and displaces individuals, including spawning salmon

Off-site effects of surface mining may be more severe than on-site effects. The most significant effect is the potential severe impacts to fish populations if the sediment loading or buildup of toxic substances occurs in clear water streams. Spawning salmon may be directly eliminated, spawning habitat may be destroyed, or the eggs or fry may be destroyed. A carefully planned and conducted mining operation, with proper effluent and sedimentation controls, would mitigate most potential adverse impacts, minimizing most potential impacts to salmon.

The development of mining claims within the active stream channel of an anadromous stream creates a serious use conflict and could jeopardize the commercial, sport, and subsistence harvest of salmon and the overall economic and sociocultural structure of the Bristol Bay region. In general, instream placer mining can seriously degrade anadromous stream habitat by producing excessive sediment, increasing turbidity, changing pH, adding toxic heavy metals to stream water, and altering stream channels and stream flows. The effects of placer mining immediately adjacent to streams are similar to other land disturbance activities (i.e., logging, agriculture, vegetation removal, road construction) that can introduce unnaturally high levels of sediment into stream environments. Existing literature contains many studies, reports, and documents on the effects of increased sediment loads on salmonids, food chain components, and on aquatic ecosystems. Properly designed and maintained settling ponds and recycling systems when utilized, may minimize some impacts of sedimentation on aquatic life. The major conclusions reached by investigators studying the effects of placer mining and sedimentation on aquatic life and stream systems are summarized by Madison (1981) as follows:

1. Effects on Fish Life

   - Temporary or permanent destruction or modification of spawning beds that can result in failure to spawn or complete or partial mortality of eggs, alevins, or fry. The primary causes are: Reduction of dissolved oxygen, increase in the percentage of silt and sand in the spawning gravel, reduction in intergravel flow rates, scouring of the spawning gravels subsequent to spawning, removal of stream gravels, or complete covering of the spawning beds with sediment;

   - Loss of available food supply due to reductions in production at the lower trophic levels (plant life and benthic invertebrates);

- Interference with the sight-dependent feeding habits of salmonids;

- Obliteration of hiding or living areas in gravel by clogging of the interstices with fine sediment, or by reduction of pool areas;

- Short-term exposure to very large concentrations of suspended sediment that can cause fish mortality through damage to the gill structure; and

- Avoidance of normal spawning areas (even at relatively low turbidity) and displacement to cleaner tributaries or other sections of a stream.

2. Effects on Aquatic Plant Life

- Reduction in photosynthetic activity and consequent reduction in growth of algae and macrophytes which form the basis of the food chain for salmon and other freshwater fish;

- Smothering of plant life inhabiting the stream bottom; and

- Increase in the mobility of the substrate.

3. Effects on Benthic Invertebrates

- Reduction in the abundance and diversity of benthos as a result of reduction in available food supply (plant life), increased drift and susceptibility to predation, clogging of the feeding apparatus by fine sediments, and loss of available or suitable substrate habitat; and

- Changes in community composition from clean-water species to species more adaptable to higher sediment levels but possibly less suitable as fish-food organisms.

4. Physical Effects on the Hydrologic System

- Increased turbidity and resultant reduction in light penetration;

- Alteration of channels, including changes in slope, stream velocity, discharge, depth and width, scouring characteristics, stream length, pool-riffle ratio, ground-water/surface-water relationships, ground-water recharge characteristics, and water temperature; and

- Changes in the stream bottom material, including changes in the particle-size composition which may change the rate of intergravel water flow, deposition of fine material and gravel on riffle areas, and changes in bedload movement.

Recent studies completed by researchers at the University of Alaska, Fairbanks (LaPerriere et al., 1983 and Van Nieuwenhuyse, 1983) have substantiated many of these same effects on freshwater habitats in Alaska. In brief, Alaskan researchers have found that mining-induced sedimentation and turbidity results in reduced light penetration, reduced production of

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plant material, and ultimately a decrease in the production and abundance of fish. In Birch Creek, an anadromous stream heavily impacted by mining, all fish, insect life, and even most algae had been eliminated as a result of mining. Mining-induced turbidity also adversely effects the human use of clear-water habitat for sport fishing, river floating, canoeing, and other recreational activities.

JUSTIFICATION FOR LEASEHOLD LOCATION ORDER:

Title 38 of the Alaska Statutes addresses the management of public lands of the State of Alaska. Section 38.05.185 reads:

> "State land may not be closed to mining or mineral location unless the commissioner makes a finding that mining would be incompatible with significant surface uses on the state land. State land may not be restricted to mining under lease unless the commissioner determines that the potential use conflicts on state land require that mining be allowed only under written lease issued under AS 38.05.205 or the commissioner has determined that the land was mineral in character at the time of state selection."

Section 38.05.185 provides further:

> "The determination required under this subsection shall be made in compliance with land classification orders and land use plans developed under AS 38.05.300."

A land use plan such as the Bristol Bay Area Plan is an appropriate forum for classifying state lands and designating specific areas for mineral closures or leasehold locations when these areas meet the criteria set forth in Section 38.05.185.(See also 11 AAC 55, Land Planning and Classification Regulations.)

The Bristol Bay Area Plan recognizes continued salmon propagation and production as a significant surface use of state lands in the Bristol Bay region. The plan also recognizes that certain areas also have favorable potential for the discovery of mineral resources. The plan states:

> "In addition..." (to the closure of the designated anadromous portion of these 64 streams closed to new mineral entry in the Bristol Bay Area Plan, Mineral Closing Order 393) "... the plan requires that mining activities on State selected, patented, and tentatively approved land in the watersheds east of Iliamna Lake and in the upper Mulchatna drainage be subject to the State's leasehold location laws to ensure that mining activities do not adversely affect salmon propagation and stream productivity. Valid existing mining claims are not affected by these proposals."

Mining operations occurring in the upper Mulchatna and eastern Iliamna Lake areas could create serious surface use conflicts with the continued propagation and production of salmon. This surface use activity is the

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mainstay of the Bristol Bay economy and is also a substantial contributor to the state economy. Mining in these areas without proper mitigation measures to reduce the increased runoff and resultant increases in sedimentation, toxic metals, and acid runoff could create serious use conflicts in anadromous streams and jeopardize the overall productivity of anadromous streams in Bristol Bay, and ultimately, the economy of the Bristol Bay region and the livelihood of area residents. Use of the area by other fish and wildlife, and the subsistence and recreational harvest thereof, are also significant surface uses of state land which could conflict with mining.

The restriction to leasehold location mining in these areas is justifiable under Section 38.05.185 and essential to the maintenance of salmon, other fish and wildlife, and subsistence, commercial, and recreational uses of these resources. Leasehold location would allow for the continued exploration and development of potential mineral resources in an environmentally sound manner.

Only those areas which are likely to be in highest conflict with mining activities are to be subject to leasehold location mining. Conflict was determined by the juxtaposition of an area with high production and propagation values for salmon with known and verified mineral terranes in the Bristol Bay study area. Existing mining claims are not affected by the subject leasehold location order. The restriction to leasehold location mining of the above mentioned areas, as described in Attachment A, encompasses an estimated 1,979,000 acres of state land.

The 1982 and 1983 commercial sockeye salmon harvest and escapement data for the Bristol Bay and North Alaska Peninsula Fishery Management District show that approximately 75% of the commercial sockeye salmon harvest and 72% of the sockeye salmon escapement originates or spawns in the Nushagak/Mulchatna, Kvichak/Iliamna, Sandy, Bear, or Caribou river drainages where mineral closures and leasehold location mining have been required by the Bristol Bay Area Plan. By restricting this portion of the Bristol Bay study area to mineral leasehold location where conflicts between fishery production and mining would most likely occur, protection can be provided to a large portion of the Bristol Bay sockeye salmon run.

Existing state and federal water quality regulations and standards are considered inadequate to guarantee the continued propagation and production of the salmon and other fish resources in the stream waters in the Bristol Bay area. The past and present lack of compliance with and enforcement of these water quality standards in this area and other areas in the state were some of the factors considered during development of the Bristol Bay Area Plan. The existing standard for turbidity, a measure of suspended sediment, allows for levels of sediment which some experts indicate is detrimental to salmon and their eggs and fry. These levels create conditions which make adequate and effective fishery management extremely difficult due to the inability to visually determine escapement.

The potential destruction of upland wildlife habitat from the improper removal of vegetation and soil from an area of mining activity was also

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considered in the decision to require leasehold location mining. Stipulations attached to the mineral leases would guide the development of a mining operation so impacts to habitat would be reduced and/or mitigated. The result of these analyses was to restrict new mineral entry to leasehold location mining in the areas where potential use conflicts between fish and wildlife habitat and harvest and mineral exploration and development occur.

In closing, the best interest of the State of Alaska and its residents are served by the restriction of mineral entry to leasehold location mining in the areas identified in the Bristol Bay Area Plan and Attachment A under the locatable mineral leasing and mining laws of the State of Alaska.

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Attachment B

MAP 1

SALMON FRESHWATER HABITAT

ANADROMOUS FRESHWATER HABITAT

SALMON NEAR SHORE MIGRATION CORRIDOR

CLOSED TO NEW MINERAL ENTRY

0 10 20 30 40 50 MILES

0 10 20 30 40 50 KILOMETERS

N

Bristol Bay Area Plan

FISH DISTRIBUTION

PREPARED BY: HABITAT DIVISION ALASKA DEPT. OF FISH & GAME SEPT 1983

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MAP 2
Bristol Bay Area Plan
CARIBOU DISTRIBUTION
ALASKA DEPT. OF FISH & GAME
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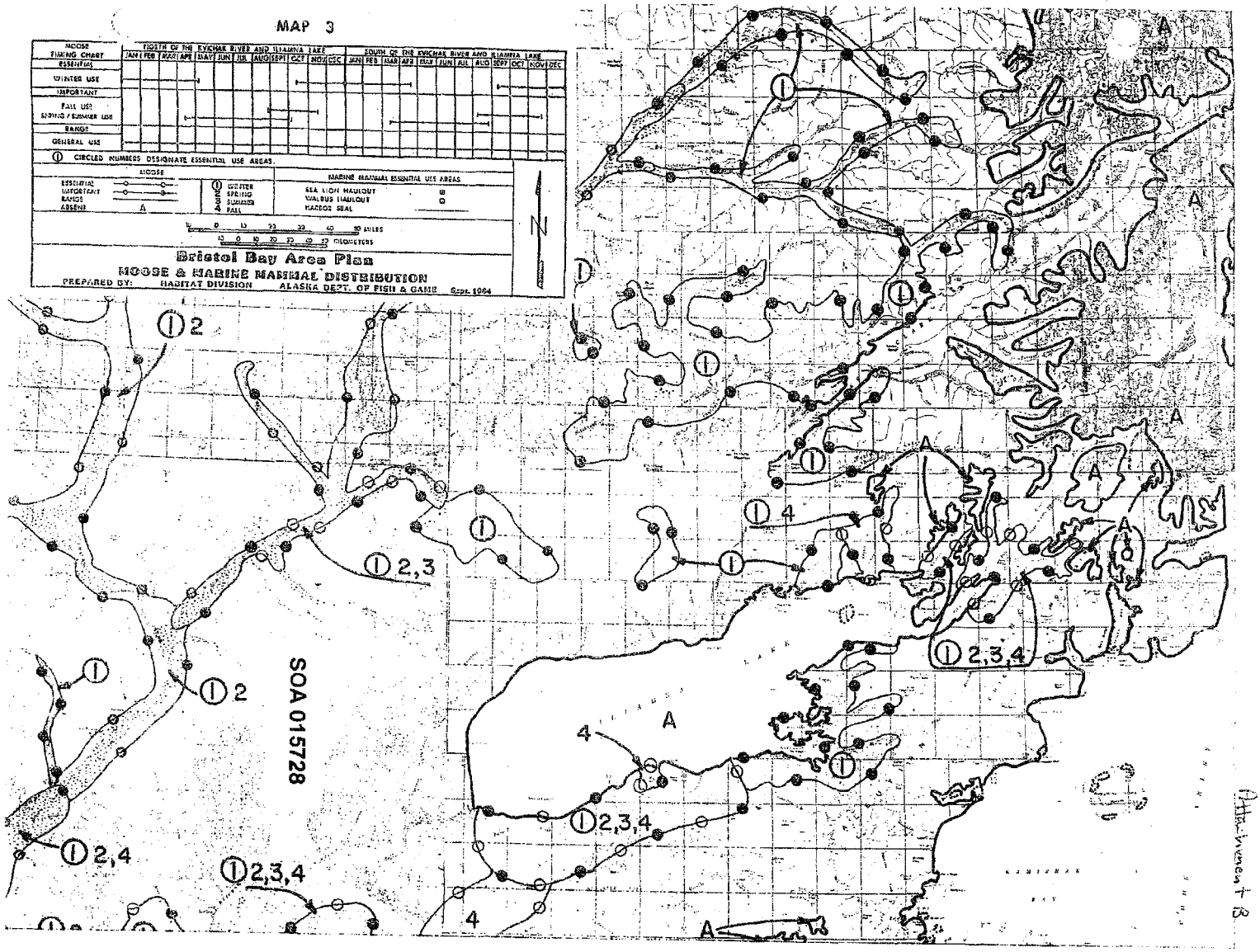

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Attachment B

MAP 4

NOTE: UTILIZATION AREAS USED BY WATERFOWL ARE NOT INTENDED TO BE INCLUDED AS ESSENTIAL CONSERVATION HABITAT RECEIVING THIS DATA MAY APPLY TO SMALL ISOLATED UPLANDS SURROUNDED BY ESSENTIAL WATERFOWL HABITAT.

Bristol Bay Area Plan

RAPTOR, WATERFOWL & MARINE BIRD DISTRIBUTION

PREPARED BY: HABITAT DIVISION ALASKA DEPT. OF FISH & GAME Sept. 1979

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Attachment B

MAP 5

NOTE: SOLID LINES WITHIN PERIODS WHICH MOST BEAR INHABIT A PARTICULAR USE AREA.
DASHED LINES INDICATE TIME FRAMES WHEN BEAR UTILIZE TIME AREAS BUT IN LESSER NUMBERS.

TIMING CHART	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
ESSENTIAL												
STREAM CONCENTRATION FEEDING USE												
IMPORTANT												
FALL USE												
SUMMER USE												
DENNING AREAS												
RANGE												
GENERAL USE												

① CIRCLED NUMBERS DESIGNATE ESSENTIAL USE AREAS (POLYGON INFORMATION)

ESSENTIAL — 0 —
IMPORTANT — 3 —
RANGE

ESSENTIAL STREAM CONCENTRATION AREA

① SPRING
SUMMER
FALL
DENNING

12 0 10 20 30 40 50 MILES
10 0 10 20 30 40 50 KILOMETERS

Bristol Bay Area Plan
BROWN BEAR DISTRIBUTION

PREPARED BY: HABITAT DIVISION ALASKA DEPT. OF FISH & GAME Sept. 1984

SOA 015730

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Attachment C

The guidelines developed in the Bristol Bay Area Plan (BBAP) should be reviewed and included, as appropriate, in future leases under AS 38.05.205. Chapter II of the BBAP presents these guidelines. These guidelines should be applied along with standard and any special stipulations developed by the State of Alaska. Guidelines of Chapter II are attached, those which may be applicable to mineral leasehold location are noted with a dot.

SOA 015731

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CHAPTER II
AREAWIDE PLANNING GOALS AND GUIDELINES*

INTRODUCTION

This chapter presents the goals and guidelines by resource element. The resource elements and land uses addressed in the plan are agriculture, alternative energy, environmental and cultural resources, fish and wildlife, forestry, minerals, oil and gas, recreation, settlement, and transportation.

The Bristol Bay Area Plan incorporates four of the five goals stated in section 1203(b)(1-5) of ANILCA as General Plan Goals. These are:

- Conserve the fish and wildlife and other significant natural and cultural resources within the region.
- Provide for the rational and orderly development of economic resources within the region in an environmentally sound manner.
- Provide for such exchanges of land among the Federal Government, the state, and other public or private owners as will facilitate the carrying out of paragraphs (1) and (2).
- Identify any further lands within the region which are appropriate for selections by the state under Section 6 of the Alaska Statehood Act and this Act.

These general plan goals are achieved through the land allocations of the plan, the recommended land exchanges, state selections, cooperative agreements, and, through other more resource specific goals and guidelines. The guidelines presented are designed to aid in achieving the general plan and resource specific goals by giving specific guidance to land managers and regulatory agencies consistent with the intent of the relevant goal. The guidelines give guidance on important activities such as settlement, mining and transportation where existing state or federal statutes or regulations leave agencies a great deal of discretion when making a decision.

The guidelines are consistent with existing statutes or regulations. There are cases where the guidelines reference or repeat existing regulations to emphasize the importance of enforcing that particular regulation in Bristol Bay. Generally, the guidelines apply to all DNR land management and regulatory activities and to certain permitting authorities of ADF&G and ADEC.

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* Many important terms and phrases (e.g. "will," "will to the extent feasible and prudent," "should," etc.) are used in the provisions and guidance description and throughout the plan. The reader is advised to refer to the Area Plan Glossary for the definition of terms used.

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The guidelines will be implemented through the agency procedures that are in place at the time a permit, lease, sale, or other pertinent decision is made. Specific authorities and procedures are identified in individual guidelines where this clarification is felt to be necessary. Implementation is consistent with existing federal, state and local laws.

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AGRICULTURE/GRAZING

Background

The soils and climate for much of the Bristol Bay area are marginal or sub-marginal for agriculture. Historically agriculture has not played a significant role in the local economy or residents' lifestyles. Local residents have relied (and to a large extent still do rely) on the harvest of wild animals and plants for their nutritional needs. Local residents do have small gardens in some of the communities. Cool weather crops (potatoes, turnips, rutabagas, and members of the cabbage family) can be grown successfully in a few areas.

There has been very limited grazing of domestic animals in the area. The only large-scale grazing involves a herd of 350 reindeer on Hagemeister Island. Grazing of sheep and cattle does occur on some of the islands south of the Alaska Peninsula and on several of the Aleutian Islands. Grazing of domestic animals, other than reindeer, would probably require the importation of large quantities of supplemental feed.

Plan Provisions - Agriculture/Grazing

Though a portion of the region was selected by the State of Alaska for its agricultural potential, the resource analysis and U.S. Soil Conservation Service work related to this plan concluded that the region does not have commercial agricultural potential. Consequently, the plan only endorses local agricultural activities to supplement food needs in village areas where cool weather crops can be grown (primarily the Nushagak River villages). Use of most state lands for large scale grazing is prohibited as large scale domestic livestock or reindeer grazing would compete with existing caribou herds for limited vegetation.

Regional Goals and Guidelines - Agriculture/Grazing

Goal

> Reduce food costs and lower the region's dependence on imported foods by maintaining a land base for small-scale, non-commercial agriculture.

Guideline

1. Grazing

Use of most state lands for large scale grazing is prohibited as domestic livestock grazing would compete with wildlife populations. Small scale domestic operations may be permitted where the land manager, after consultation with ADF&G, determines that there is no significant conflict with wildlife populations.

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ALTERNATIVE ENERGY

Background

Energy is a major concern in the Bristol Bay region. Most energy is produced by noncentralized, diesel-power generators. In most smaller villages there are up to three diesel generators of 50 to 150-kw capacity, often owned by the school district, which supplies power to some individual residences. Home heating is mainly by fuel oil, with some use of electric spaceheaters and wood.

The Alaska Power Authority (APA) and Army Corps of Engineers (COE) have undertaken extensive studies to assess the feasibility of developing alternate sources of energy generation for the region. The APA's studies have focused on a regional hydroelectric system, with the more favorable sites being Chikuminuk Lake in the northern part of Wood-Tikchik State Park and the Newhalen River rapids (stream diversion) near Iliamna Airport. Potential hydroelectric sites have been identified for small local systems at Chignik (COE), King Cove, and Togiak. Wind may also provide a potential alternate source of energy, particularly on the Alaska Peninsula. Geothermal energy resources in the Bristol Bay region have been evaluated as having only moderate or low development potential.

Plan Provisions - Alternative Energy

At least three alternate hydroelectric power sites are still being examined by the Alaska Power Authority for large hydropower project potential. Since this examination has not been completed, the plan endorses continued study of hydropower options but does not make a recommendation regarding hydropower development. The plan guidelines require that any hydropower development not cause a net loss of fish production. The plan also recommends alternate energy resources, including natural gas, be considered more extensively.

Regional Goal - Alternative Energy

Goal

> Maintain opportunities to develop and use appropriate hydroelectric, wind, geothermal, natural gas, peat, coal, or other energy resources.

Guideline Cross Reference - Alternate Energy (Hydroelectric Projects)

See - Instream Flow (page 2-11)
See - Structures in Fish Habitat (page 2-13)
See - Water Intake Structures (page 2-13)
See - Stream Alteration (page 2-13)
See - Design and Mitigation of Hydro Projects (Page 2-13)

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Guideline Cross Reference - Alternate Energy (Transmission Lines)

See - Transmission Lines (page 2-41)
See - New Public Roads and Utilities in Caribou Migration Routes (page 2-42)
See - Transmission Lines in Essential Waterfowl Habitat (page 2-44)
See - Transmission Lines and Conflicts with Raptors (page 2-44)

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ENVIRONMENTAL AND CULTURAL RESOURCES

Background

The Bristol Bay region has been inhabited for at least the last 9,000 years. The Native people of the region are very diverse and represent three major groups: the Aleuts on the western end of the Alaska Peninsula, the Tanaina Athapaskan Indians in the vicinity of Lake Clark, and the Yupik Eskimos over the remainder of the region. Cultural influences from the north spread across the Alaska Peninsula around A.D. 800, putting to an end several thousand years of nearly complete isolation. The first outside contact with Natives occurred in the mid 1700's by the Russians, and since then fishing, trapping, and recreation have contributed significantly to the area's development. Much of the traditional dependence on salmon, big game, and marine mammals is still in evidence today in the subsistence culture of many residents.

Plan Provisions - Environmental and Cultural Resources

The plan recognizes the importance of protecting air and water quality if the human, fish and wildlife resources of the region are to be maintained. The plan emphasizes the need to maintain water quality classifications and standards at levels necessary to protect the human, fish, and wildlife resources of the region. The plan also recognizes the need for, and emphasizes the importance of, enforcing existing water quality regulations in the Bristol Bay region.

Guidelines address the protection of historic and cultural resources, maintenance of water quality, and community public notice procedures for activities which affect subsistence resources.

Regional Goals and Guidelines - Environmental and Cultural Resources

Goals

A. Maintain a level of air and water quality sufficient to protect the human, fish, and wildlife resources of the region.

B. Make the maximum amount of water available for human use and benefit while maintaining a level of water quality sufficient to protect the fish, wildlife, and other resources of the region.

Guidelines

1. Historic and Cultural Resources

   The State will provide appropriate protection of historic and cultural resources. Establishing adequate inventory programs and project planning processes that give consideration to these resources early in

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the development process should be a high priority. Locations of known existing sites are depicted in the Automated Data Base or on maps available from the DNR, Division of Parks, State Historic Preservation Office.

2. Water Quality

It is the intent of the plan that domestic and public water supplies, fresh and marine waters important for the production and management of waterfowl and fish, and water used for recreation will at a minimum be classified by DEC for these uses and that state water quality standards will be maintained by DEC at levels necessary to maintain or enhance these uses. All permits, leases or plans of operations for land or water uses which may directly affect water quality will require that these activities be sited, designed, constructed and operated to provide a reasonable assurance that discharges will meet water quality standards for the receiving water use classification. Water quality standards will meet or exceed those criteria set out in 78 AAC 70 (State Water Quality Criteria) and by the U.S. Environmental Protection Agency rules and regulations for these uses. Amendment of state water quality standards or reclassification of waters may be made through ADEC amendment procedures and does not require amendment of the plan. However, ADEC will provide public notice in a newspaper of general circulation within the region, and provide notice and an opportunity to comment to affected state and federal agencies and local governments before streams in the planning area are reclassified or standards changed.

Guideline Cross Reference - Water Quality

See - Instream Flow (page 2-11)
See - Buffers Adjacent to Fish Habitat (page 2-11)
See - Discharge of Drilling Muds (page 2-30)

3. Public Notice

When the land manager determines that an action requiring public notice under AS 38.05.345 or AS 46.15.133 may have a significant impact on subsistence use, public land managers will give notice of the proposed action to appropriate communities using the area for subsistence, as identified on Maps 6,7 and 8, Appendix A, and to Coastal Resource Service Area (CRSA) boards.

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FISH AND WILDLIFE

Background

All five species of Pacific salmon are indigenous to the Bristol Bay area with sockeye salmon being of highest importance commercially. The average ex-vessel value for salmon catches (all species) in the study area (1977-1982) have exceeded $150 million annually with the 1st wholesale value surpassing $250 million in 1982. In 1983, a record commercial catch of more than 39 million sockeye salmon was recorded with an ex-vessel value greater than $145 million (this does not include catches from the S. Alaska Peninsula and Chignik areas). The 1982 Bristol Bay herring catch exceeded 58 million pounds with an ex-vessel and 1st wholesale value of $8.6 million and $21 million, respectively.

Over 3,500 limited entry or fishing permits have been issued in the salmon and herring fisheries utilizing a compliment of over 7,700 commercial and 1,100 subsistence fishermen. Approximately 67% of the licensed gear holders are Alaska residents, and 70% of these are Bristol Bay residents. Twelve shorebased canneries in Bristol Bay employ more than 2,000 cannery workers each season with floating processors employing an additional 700 workers. Overall, more than 10,000 people are employed by the Bristol Bay fisheries annually.

Income attributable to sport fishing and hunting in the Bristol Bay area is conservatively estimated at $25-30 million annually. A large percentage of sport fishermen and hunters visiting the Bristol Bay area are from out of state. Sport fishing and hunting incomes are expected to increase in the future. Sport fish angler days have shown a substantial increase (14% annually) during the period 1977-1982.

Subsistence use of fish and wildlife is based on customary and traditional practices and is motivated by economic, social and cultural goals. The most important subsistence resources are salmon and caribou which are taken in substantial quantities by residents of nearly every community in the Bristol Bay study area. The value of subsistence resources cannot be quantified in common economic terms. The cultural and social values of subsistence resources are, nonetheless, substantial to the residents of Bristol Bay study area.

Plan Provisions - Fish and Wildlife

The Bristol Bay Area Plan places fish and wildlife habitat and harvest as a primary use throughout the Bristol Bay study area. Commercial fishing, sport fishing and hunting, and subsistence activities are all based on renewable fish and wildlife resources. The harvest and nonconsumptive use of these fish and wildlife resources are a major economic resource value to residents of the Bristol Bay area, the State of Alaska, and the Nation. Through implementation of the plan (including plan guidelines), fish and wildlife resources and the income and employment generated from the harvest

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of fish and wildlife resources can be expected to continue indefinitely, thereby providing a sound economic base for Alaska and the Bristol Bay area.

Fish and wildlife species have differing threshold capacities to surrounding stimuli, whether the stimuli stem from development, settlement, recreation pressure or other activities. As a result, the plan provides for varying degrees of protection to fish and wildlife species and their habitat. Spawning areas, calving areas, wintering areas, and migration corridors are specifically addressed. The following plan provisions will be implemented to assure maintenance of existing fish and wildlife population levels.

- Closure of 64 anadromous streams and any state owned uplands 100 feet from ordinary high water (on both sides of the stream) to new mineral entry in accordance with AS 38.05.185. Valid existing mining claims are not affected. (See mineral section for a complete listing of anadromous streams closed to new mineral entry).

- Closure of navigable waterbodies within Togiak, Becharof, Alaska Peninsula, and Izembek National Wildlife Refuges and navigable waterbodies in the National Parks which drain into Bristol Bay to mineral entry.

- State lands in the upper Mulchatna drainage and drainages in the east Iliamna Lake area will be subject to mineral leasehold location. Valid existing mining claims are not affected.

- State oil and gas lease sales will not be scheduled in the tide and submerged lands of the Bristol Bay Fisheries Reserve (Management Subunit 1D).

- Surface entry for oil and gas exploration and development in Iliamna Lake, Upper and Lower Ugashik Lakes, and Becharof Lake pursuant to AS 38.05.140 (f) (Bristol Bay Fisheries Reserve Legislation) is prohibited.

- State oil and gas lease sales will not be scheduled in the tide and submerged lands that comprise the Goodnews/Togiak herring spawning area (Management Subunits 1A, 1B, and 1C).

- A ten year oil and gas leasing moratorium has been placed on the remaining state tide and submerged lands south of Cape Menshikof (Management Subunits 1E and 1F). No oil and gas leasing can occur in this area prior to 1994.

- State oil and gas lease sales will not be scheduled in the following bays and lagoons: Cinder River Estuary; Port Heiden; Seal Islands Lagoon; Port Moller; Herendeen Bay; Nelson Lagoon; Izembek Lagoon; Moffet Lagoon; and Bechevin Bay. These bays and lagoons provide essential habitat for fish, waterfowl, and marine mammals.

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- Surface entry for oil and gas exploration development in the Black and Chignik Lakes and Chignik River is prohibited.

- Surface coal development within one mile of Black Lake and any active salmon spawning streambed in the Chignik area (Management Unit 23) is prohibited.

- The plan calls for ADF&G to negotiate with individual landowners to discuss cooperative agreements for the lease or purchase of research and management sites throughout the plan area. These sites include fish counting and monitoring stations, hatcheries, fish sampling sites and access for fish investigation sites.

- The use of most state lands for large scale grazing is prohibited as domestic stock grazing (reindeer) would compete with caribou populations for grazing habitat.

- Surface entry for oil and gas and mining in those portions of Izembek State Game Refuge within Management Unit 30 is prohibited.

- Settlement, through the state land disposal program, has been restricted to approximately 14,000 acres of state land sales primarily for recreational purposes. Disposal areas are concentrated around regional centers such as Dillingham, the Iliamna Lake area, and in the vicinity of Port Moller and Cold Bay.

- The plan calls for a number of recommended land exchanges, cooperative management agreements, state land selections and relinquishments, and additions to the Wood-Tikchik State Park in an effort to improve wildlife management.

- Guidelines addressing water quality, fish and wildlife enhancement, and prevention of fish and wildlife habitat alteration were developed.

Regional Goals and Guidelines - Fish and Wildlife

Goals

A. Maintain the historic levels of productivity of fish and wildlife populations important for commercial, subsistence and recreational use and maintain the carrying capacity of their natural habitats.

B. Provide for optimum commercial, subsistence, and recreational use of fish and wildlife resources through conservation and compatible management of land use consistent with purposes of the plan.

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Guideline for All Species

1. Enhancement

Enhancement on state land is an acceptable fish and wildlife management practice where it has been determined to be scientifically sound, compatible with land managers objectives, and where public review shows it to be in the public interest. Proposals for fisheries enhancement activities will evaluate and consider the importance, values and advantages of maintaining the genetic integrity of wild and indigenous fish populations. All fisheries enhancement and related activities will only use local, wild, indigenous stocks.

Guidelines for Individual Species

The following guidelines are specific to a particular species or species group and are arranged with fish first, followed by caribou, moose, waterfowl, brown bear, marine birds, marine mammals, and, finally, eagles. Where appropriate, guidelines are written for each species to address the following: habitat alteration and destruction; disturbance; and impacts on harvest.

Guidelines to Prevent Fish Habitat Alteration and Destruction

1. Instream Flow

Except for public water supply and domestic use, the maintenance of fish stocks is generally the highest priority water use in the study area. Therefore, the DNR will not allow an appropriation of water to cause the instream flow to fall below the amount determined necessary by ADF&G and/or USFWS to protect fish habitat and production and waterfowl habitat, unless, under the procedures outlined in AS 46.15.080, the Commissioner of DNR makes a finding based on public review that the competing use of water is in the best public interest and no feasible and prudent alternative exists. (This guideline is in accordance with the Cooperative Agreement among the ADF&G, the ADEC, and the ADNR.

2. Buffers Adjacent to Fish Habitat

To minimize negative impacts on water quality and public access, the State will retain a publicly-owned vegetated (if naturally occurring) strip of land or an easement as a buffer on lands adjacent to fish habitat for the activities outlined below. This entire guideline does not apply to land exchanges and non-discretionary land conveyances, such as Native selections, Native allotments, mineral patents, etc.

The size of river, lake, and stream buffers will be decided by the public land manager on a case-by-case basis and may vary depending on the nature of the activity proposed and the particular values of the stream, lake, or river.

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When disposing of land for settlement or commercial recreation facilities land managers will decide on a case-by-case basis whether the buffer will be publicly owned or an easement. Public ownership of the buffer is preferred on streams, rivers and lakes important to the production of anadromous fish or with important public use values. If an easement is used, no development or clearing except for access purposes will be allowed within the easement.

Generally, public land disposals for settlement, commercial recreational facilities, or similar low density, non-water dependent uses should have a minimum buffer of 200 feet landward of the ordinary high water mark(s). However, adjacent to designated anadromous fish spawning habitat, the buffer will, to the extent feasible and prudent, never be less than 100 feet landward of the ordinary high water mark(s).

Permits, leases, and plans of operation for non-water dependent commercial and industrial uses, transportation facilities, and pipelines will, where feasible and prudent, require setbacks between these facilities and adjacent water bodies to maintain streambank access and protect adjacent fish habitat, public water supplies, and public recreation. The width of this setback may vary depending upon the type and size of non-water dependent use, but will be adequate to maintain access and protect adjacent waters from degradation below the water quality standard set by DEC. Adjacent to designated anadromous fish spawning habitat this setback will, to the extent feasible and prudent, never be less than 100 feet landward of ordinary high water.

Where it is not feasible and prudent to maintain a setback adjacent to fish habitat, public water supplies and recreational waters, other measures will be implemented to meet the intent of this guideline.

Where buffers are smaller than the minimum, soil erosion will, to the extent feasible and prudent, be minimized by restricting the removal of vegetation adjacent to fish-bearing waterbodies and by stabilizing disturbed soil as soon as possible. Adequate stabilization practices and timing will be determined on a case-by-case basis.

Private landowners are encouraged to maintain development setbacks equivalent to the buffers described here and to follow soil erosion mitigation practices.

This guideline is not intended to preclude or restrict necessary stream, river or lake crossings.

3. Wetlands Identification and Protection

Within an area slated for development, wetlands that are hydrologically important to fish should be identified by ADF&G prior to any developmental activities in order to avoid negative impacts on the fish. Consistent with existing laws and regulations, permits for

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activities in wetlands that are hydrologically important to fish will, to the extent feasible and prudent, provide for the maintenance and non-degradation of these areas.

4. Structures in Fish Habitat

To maintain nearshore migration of juvenile fish permitting agencies will, to the extent feasible and prudent, require that structures in fish habitat be built to minimize impacts on fish migration.

5. Heavy Equipment in Fish Habitat

Permits issued for developmental activities that require the use of heavy equipment in fish habitat or wetlands that are hydrologically important to fish habitat identified by ADF&G will, to the extent feasible and prudent, minimize damage to wetlands and wetland vegetation.

6. Water Intake Structures in Fish Habitat

Tideland permits or leases, water appropriations, and/or Title 16 permits for water intake pipes used to remove water from fish bearing waters will require that the intake be surrounded by a screened enclosure to prevent fish entrainment and impingement. Pipes and screening will be designed, constructed, and maintained so that the maximum water velocity at the surface of the screen enclosure is not greater than 0.1 foot per second. Screen mesh size will not exceed 0.04 inch unless another size has been approved by ADF&G. Other technology and techniques which can be demonstrated to prevent the entrainment and impingement of fish may also be utilized.

7. Stream Alteration

Developmental activities in or adjacent to fish habitat will, to the extent feasible and prudent, not significantly alter the natural stream course or channel.

8. Design and Mitigation of Hydroelectric Projects

Hydroelectric projects will not dam, divert or draw down rivers, streams, or lakes that support important commercial, subsistence, or recreational fish species unless the project will be designed or mitigated so as to cause no net loss to fish production in the area affected by the project.

9. Use of Explosives in Fresh and Marine Waters

Permits issued for geophysical surveys in fresh and marine waters will require the use of non-explosive energy sources such as airguns, gas exploders, or other sources that have been demonstrated to be harmless to fish, seabirds, and marine mammals.

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Permits for blasting for purposes other than geophysical surveys may be approved on a case-by-case basis when all steps have been taken to minimize impacts and when no feasible and prudent alternative exists to meet the public need.

Guideline Cross Reference - Fish Habitat Alteration and Destruction

See - Water Quality page 2-7
See - Enhancement (page 2-11)
See - Mineral Exploration (page 2-25)
See - Dredge, Fill, and Shoreline Alternation (page 2-25)
See - Extracting Materials or Mining in, or Adjacent to Fish Habitat (page 2-25)
See - Mining Plan of Operation-Leasehold Location Areas (page 2-26)
See - Reclamation-Leasehold Location Areas (page 2-27)
See - Oil and Gas Pipelines (page 2-30)
See - Discharge of Drilling Muds (page 2-30)
See - Recreational Facility Siting (page 2-33)
See - Stream Crossings (page 2-41)
See - Bridges and Culverts (page 2-42)
See - Winter Roads and Winter Access Over Rivers, Lakes, and Streams (page 2-42)

Guidelines to Prevent Caribou Disturbance

1. Non-Oil and Gas Development and Caribou Calving Habitat

   Commercial and industrial developments that are likely to cause significant impact to caribou calving and that can not be restricted seasonally will avoid essential caribou calving habitat, identified on Map 2 in Appendix A. This guideline does not apply to oil and gas activities.

2. Oil and Gas Facilities in Caribou Calving Habitat

   Facilities essential to the production and transportation of oil and gas which cannot be located outside of essential caribou calving habitat are allowed in these habitats. Non-essential facilities and activities which are determined by the land manager, after consultation with ADF&G and other appropriate agencies, likely to displace caribou from essential caribou calving habitat will, to the extent feasible and prudent, be located outside caribou calving habitat. Oil and Gas exploration, development, and construction activities are not subject to this guideline (see caribou guideline 3 and 4, and transportation guideline 14).

3. Seasonal Restrictions of Oil and Gas Development in Caribou Calving Habitat

   Leases and/or permits will require that oil and gas activities that can be restricted seasonally (excluding production and transportation) be

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restricted seasonally in order to minimize impacts to calving caribou during May 1 through June 15 north of the Kvichak River and Iliamna Lake and May 7 through June 15 south of the Kvichak River and Iliamna Lake. Caribou calving habitat is depicted on Map 2, Appendix A. Seasonal restrictions will be required by the land manager when 1) significant numbers of calving caribou are present in the area; and 2) available scientific information indicates that the activity is likely to result in detrimental disturbance to calving caribou. This guideline does not apply to seismic activity (see caribou guideline 4 and transportation guideline 14.)

4. Blasting in Caribou Wintering and Calving Habitat

The surface detonation of explosives (not including firearms) should not be allowed in essential caribou wintering habitat and will, to the extent feasible and prudent, not be allowed in essential caribou calving habitat identified on Map 2 Appendix A during the period May 1 through June 15 north of the Kvichak River and Iliamna Lake, and May 7 through June 15 south of the Kvichak River and Iliamna Lake. Subsurface detonations of explosives at depths specifically tested and found acceptable may be permitted at the charge size and at the depths tested, if tests show that noise, ground shock levels, and associated activities do not displace caribou or detrimentally affect caribou calving behavior. Before issuing permits for the detonation of explosives during sensitive periods, land managers will consult with ADF&G and ADF&G will provide a determination of whether significant numbers of caribou are present.

Guideline Cross Reference - Caribou Disturbance

See - Enhancement (page 2-11)
See - Recreation Facility Siting (page 2-33)
See - Lands that Can Be Sold (page 2-36)
See - New Public Roads or Utilities in Caribou Migration Routes (page 2-42)
See - Fixed Wing Aircraft and Helicopters (2-42)
See - Above Ground Pipelines (page 2-43)
See - Repeated Off Road Access in Essential Moose and Caribou Habitat (page 2-43)

Guidelines to Prevent Moose Habitat Alteration and Destruction

1. Roads, Seismic Lines and Transmission Lines in Moose Habitat

Road rights-of way, seismic lines, and transmission lines, will, to the extent feasible and prudent, be designed and sited to parallel or skirt and not bisect essential or important moose habitat, identified on Map 3 in Appendix A.

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2. Development and Willow Vegetation

Significant destruction of willow vegetation for the purposes of industrial or commercial development or transportation corridors will be avoided to the extent feasible and prudent. Uses that require a developmental plan or plan of operation will address prompt mitigation of impacts on essential moose winter habitat, identified on Map 3 in Appendix A, including prompt revegetation. Willow vegetation is the primary winter food source in essential moose wintering areas in Bristol Bay.

Guideline Cross Reference - Moose Habitat Alterations and Destruction

See - Enhancement (page 2-11)
See - Recreation Facility Siting (page 2-33)
See - Fixed Wing Aircraft and Helicopters (page 2-42)
See - Above Ground Pipelines (page 2-43)
See - Repeated Off Road Access in Essential Moose and Caribou Habitat (page 2-43)
See - Road Construction in Essential Moose or Brown Bear Habitat (page 2-44)

Guidelines to Prevent Waterfowl Disturbances, Habitat Alteration and Destruction, and Impacts on Waterfowl Harvest

1. Activities in Essential Waterfowl Habitat

Industrial activities requiring a permit, lease, or development plan with high levels of acoustical and visual disturbance, such as boat traffic, blasting, dredging, and seismic operations, in essential spring and fall waterfowl high use areas will, to the extent feasible and prudent, be avoided during sensitive periods, identified on Map 4 in Appendix A. (This guideline does not apply to traditional hunting and fishing activities allowed by law.)

2. Airports and Other Developments in or Adjacent to Essential Waterfowl Habitat

New airports, surface transportation corridors, and other developments in or adjacent to essential waterfowl habitat that are likely to result in significant physical, visual, or acoustical disturbance to waterfowl will, to the extent feasible and prudent, be sited and designed to prevent harmful disturbance to waterfowl. Developments should be buffered from essential waterfowl habitats through appropriate measures such as distance (preferably one mile), and/or topography, vegetation, or combinations thereof to reduce disturbance.

3. Dredge and Fill in Essential Waterfowl Habitat

Land manager's permits for dredging and filling in essential waterfowl habitat, identified on Map 4 in Appendix A, including gravel extraction

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and the construction of roads and pads, will not be granted unless it is determined by the ADF&G that the proposed activity will not cause significant adverse impacts to essential waterfowl habitat or the land manager determines that no feasible and prudent alternative exists.

4. Alteration of the Hydrologic System

To the extent feasible and prudent, channelization, diversion, or damming that will alter the natural hydrological conditions and have a significant adverse impact on essential waterfowl habitat, identified on Map 4 in Appendix A, will be avoided.

5. Public Access

On public lands in essential waterfowl habitat, identified on Map 4 in Appendix A, permits and leases specifically will not restrict access for traditional public uses of these areas during hunting and fishing seasons in accordance with existing regulations. Closures that prohibit public access may be allowed immediately adjacent to facilities to protect workers' safety.

6. Public Ownership of Essential Waterfowl Habitat

Public lands designated essential waterfowl habitat, identified on Map 4 in Appendix A, will be retained in public ownership. Essential waterfowl habitat will be leased only for activities that are determined by the land manager, in consultation with ADF&G, to be compatible or which can be made compatible with the maintenance of waterfowl populations and habitats and that do not restrict traditional waterfowl harvest activities except as allowed in number 5 above. Leases ~~are~~ issued in essential waterfowl habitat for activities that may be made compatible, ~~then leases~~ will incorporate mitigation measures determined by the land manager in consultation with ADF&G, USFWS and other appropriate sources, ~~to make~~ mitigation measures the activity compatible with the maintenance of waterfowl populations and harvest activities. This guideline does not apply to land exchanges authorized by ANILCA or identified in the plan.

Guideline Cross Reference - Waterfowl Disturbance, Habitat Alteration and Destruction, and Impacts on Waterfowl Harvest

See - Water Quality (page 2-7)
See - Enhancement (page 2-11)
See - Oil and Gas Facilities in Essential Waterfowl Habitat (page 2-31)
See - Recreational Facility Siting (page 2-33)
See - Fixed Wing Aircraft and Helicopters (page 2-42)
See - Transmission Lines in Essential Waterfowl Habitat (page 2-44)

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Guidelines to Prevent Brown Bear Habitat Alteration and Destruction

1. Development in Essential Brown Bear Habitat

Commercial, recreational, or industrial developments or other uses on state lands that are likely to cause significant permanent alteration to essential brown bear habitat or that can not be restricted seasonally will, to the extent feasible and prudent, avoid essential brown bear habitat, identified on Map 5 in Appendix A. Activities that cause permanent alteration of essential brown bear habitat, that can be restricted seasonally, or that require an exploration plan, development plan, or plan of operation will require mitigation of impacts in essential brown bear habitat. Industrial or commercial development on state land should avoid areas identified as important brown bear habitat, as identified on Map 5 in Appendix A.

Guideline Cross Reference - Brown Bear Habitat Alteration and Destruction

See - Enhancement (page 2-11)
See - Recreational Facility Siting (page 2-33)
See - Lands That Can Be Sold (page 2-36)
See - Land Sales in Essential Brown Bear Habitat (page 2-37)
See - Fixed Wing Aircraft and Helicopters (page 2-42)
See - Road Construction in Essential Moose or Brown Bear Habitat (page 2-44)

Guidelines to Prevent Marine Mammal and Marine Bird Habitat Alteration and Destruction

1. Development On or Near Haulout Sites and Bird Rookeries

Commercial or industrial developments and transportation infrastructures that are likely to cause significant permanent surface alteration or that can not be restricted seasonally will, to the extent feasible and prudent, not be located on essential walrus or sea lion haulout sites or marine bird colonies, identified on Maps 3 and 4 in Appendix A. A one-half mile buffer for walrus, sea lions, and marine birds should be maintained in order to separate new commercial sites, industrial development sites, or transportation infrastructure from these essential walrus and sea lion haulouts and marine bird colonies.

2. Activities That Disrupt the Use of Essential Marine Mammal and Marine Bird Habitats

When leases, permits or plans of operation are issued for industrial activities with high levels of acoustical and visual disturbance (such as boat traffic, blasting, dredging, and seismic operations) they should be conditioned to prohibit these activities within one-half mile of sea lion haulouts from May through July, within one-half mile of walrus haulouts from April through November, or within one mile of marine bird colonies from April 15 through August 31, as identified on

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Map 3 in Appendix A. No seismic work should be conducted within one mile of Amak Island.

Guideline Cross Reference - Marine Mammal and Marine Bird Habitat Alteration and Destruction

See - Water Quality (page 2-7)
See - Enhancement (page 2-11)
See - Geophysical Surveys in Fresh and Marine Waters (page 2-14)
See - Discharge of Drilling Muds (page 2-30)
See - Fixed Wing Aircraft and Helicopters (page 2-42)

Guidelines to Prevent Eagle Habitat Alteration and Destruction

1. Activities Likely to Disturb Nesting Eagles

Permits and leases for facilities and activities that are likely to disturb nesting eagles, will be subject to conditions of the Bald Eagle Act of 1940 as amended.

Guideline Cross Reference - Eagle Habitat Alteration and Destruction

See - Enhancement (page 2-11)
See - Buffers Adjacent to Fish Habitat (page 2-11)
See - Recreation Facility Siting (page 2-33)
See - Fixed Wing Aircraft and Helicopters (page 2-42)
See - Transmission Lines and Conflicts with Raptors (page 2-44)

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FORESTRY

Background

Forest resources are sparse; less than 10% of the region is forested. Forested areas that are found in the study area grow close to large streams, rivers, and in the drier river valley bottoms. Upland mixed forests are found north of Aleknagik, in the Muklung Hills, and east of the Wood River Mountains. These areas are primarily open spruce and birch stands with numerous interspersed bogs. The most valuable forest resources for local use are in the lower Nushagak drainage near New Stuyahok, Ekwok, and Portage Creek. There are some fairly extensive forested areas between Dillingham and Aleknagik. Forests also occur in the Nushagak and Nuyakuk River drainages above Koliganek, along the Mulchatna River, on the eastern shores of Iliamna Lake, and around Lake Clark. The most extensive spruce forests in the region are in the Koksitna and Chulitna River drainages in or near Lake Clark National Park.

Plan Provisions - Forestry

Resource analysis completed for this plan concluded that there is not a large scale commercial forestry resource in this region and thus forestry use is reserved for personal or commercial house log, fire wood and construction uses within the region. Forest resources in the Nushagak/Mulchatna, eastern Iliamna Lake and Lake Clark drainages should be managed consistent with land manager's regulations governing such uses.

Regional Goals and Guidelines - Forestry

Goal

> Manage public and private forest lands to meet personal use needs of local residents for forest products and maintain or enhance other resource values.

Guidelines

1. Technical Assistance to Private Forest Owners

   The DNR should provide technical assistance to owners of private and public forest land to manage forest resources to help meet local demands for firewood and houselogs.

2. Local Use of Forest Products

   Forest products on state lands within the planning area will be available for local use in accordance with Division of Forestry guidelines and the Wood-Tikchik State Park Master Plan.

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MINERALS AND MATERIALS

Background

Historically, mining activity has not been widespread throughout the overall planning area. No rich placer deposits have been found in the Nushagak-Kvichak drainages or in the drainages of the Alaska Peninsula and few deposits were ever developed much beyond the prospecting stage. Total historical production in this area is estimated to range from 500 to 1000 fine ounces, most of which was mined near Cape Kubugakli (east of Becharof Lake) and Portage Creek (north of Lake Clark) (Cobb, 1973). However, the low historical gold production in the Nushagak-Kvichak drainage and along the Alaska Peninsula does not preclude the possibility of new placer and lode deposit finds in the future.

In the northwestern portion of the study area, two significant placer deposits have been identified by the Alaska Office of Mineral Development and the Division of Geological and Geophysical Surveys: the Goodnews Bay Platinum Placer District and the NYAC Gold District (Eakins et al.).

Placer deposits located near Goodnews Bay and NYAC have been mined since the 1920's and 1930's. Platinum mining near Goodnews Bay began in 1937 and continued until 1975. Operations were renewed in 1980 under new ownership but production thus far has been modest (Eakins et al. 1983). Several smaller mining operators have worked the area as well. Dredging operations for gold near NYAC were initiated in 1925 by the New York-Alaska Dredging Company and continued until operations ceased in the mid 1960's. More recently, the Tuluksak Dredging Company and Northland Dredging Company have been working the area (Eakins et al. 1983).

Annual operating permits were granted for only seven placer operations within the study area in 1983 (D. Lloyd, ADF&G, 1983, Pers. Comm.). The estimated 1982 gold production of the seven placer operations within the study area is 9,500 ounces, valued at approximately $3.8 million (T. Bundtzen, DGGS, 1983, Pers. Comm.). Most of this gold was probably mined by the dredges of the Tuluksak and Northland Dredging Companies on the Tuluksak River which were in full production in 1982. Nebesky et al. (1983) estimated placer mining operations in the area employed approximately 100 persons during 1982.

Plan Provisions - Minerals and Materials

The Bristol Bay study area encompasses approximately 31 million acres of state, federal, and Native lands, of which more than 13 million acres are currently open to mineral entry. The remaining upland acreage is either privately owned or was legislatively closed to new mineral entry. This includes approximately 11 million acres of federal lands closed to new mineral entry by the United States Congress in establishment of the National Wildlife Refuges and 1.4 million acres of state land closed to new mineral entry by the Alaska Legislature when it established Wood-Tikchik State Park.

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In order to protect the fisheries and recreational resources, as well as water quality, ADNR will close the designated anadromous portion of the following 64 streams (designated pursuant to AS 16.05.870) and any state owned uplands 100 feet from ordinary high water (or both sides of the stream) to new mineral entry in accordance with AS 38.05.185.

Nushagak River Drainage
- Nushagak River
- Wood River
- Muklung River (Upper 15 Miles)
- Iowithla River (Upper 15 Miles)
- Kokwok River
- Kenakuchuk Creek
- Kukwuk River
- 325-30-10100-2129-3046-4110 tributary to Kukwuk River
- Klutuk Creek
- Cranberry Creek
- Harris Creek
- Nuyakuk River
- King Salmon River
- 325-30-10100-2435-3100 tributary to King Salmon River
- 325-30-10100-2435-3116 tributary to King Salmon River
- 325-30-10100-2435-3116-4011 tributary to King Salmon River
- 325-30-10100-2435-3130 tributary to King Salmon River
- Mulchatna River
- Old Man Creek
- Koktuli River
- 325-30-10100-2202-3080-4058 tributary to Koktuli River
- 325-30-10100-2202-3080-4083 tributary to Koktuli River
- Keefer Creek
- 325-30-10100-2202-3420 tributary to Mulchatna River
- Chilchitna River
- Nikadavna Creek
- Chilikadrotna River

Kvichak/Naknek Drainage
- Kvichak River
- Pecks Creek
- 324-10-10150-2145 tributary to Iliamna Lake
- 324-10-10150-2149 tributary to Iliamna Lake
- 324-10-10150-2155 tributary to Iliamna Lake
- 324-10-10150-2159 tributary to Iliamna Lake
- 324-10-10150-2163 tributary to Iliamna Lake
- Lower Talarik Creek
- 324-10-10150-2167-3003 tributary to Lower Talarik Lake
- 324-10-10150-2175 tributary to Iliamna Lake
- Upper Talarik Creek
- Pete Andrews Creek
- Newhalen River
- Chulitna River
- Chekok Creek

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Canyon Creek
Pile River
Iliamna River
324-10-10150-2402-3025 tributary to Iliamna River
Chinkelyes Creek
Tommy Creek
Copper River
Kokhanok River
324-10-10150-2196 tributary to Iliamna Lake
Dream Creek
Dennis Creek
324-10-10150-2162 tributary to Iliamna Lake
Belinda Creek
324-10-10150-2156-3005 tributary to Belinda Creek
324-10-10150-2156-3005-4007 tributary to Belinda Creek

North Alaska Peninsula Drainages
Sandy River
Bear River
315-11-10200-2009 tributary to Bear River
Caribou River
Sapsuk River
Lefthead River
Peterson Creek

An estimated 213,000 acres of lands in the Bristol Bay area are encompassed by the stream mineral closures. Native selected and conveyed lands that fall within the active stream channel are not subject to stream mineral closures.

The streams closed to new mineral entry by the plan are not necessarily the most productive from a fishery standpoint. They are however, the streams most likely to encounter mining pressure as a result of their location within or near identified mineral terranes in the Bristol Bay area.

The Department of Natural Resources will also close any navigable waterbodies within Togiak, Becharof, Alaska Peninsula and Izembek National Wildlife Refuges and navigable waterbodies in National Parks which drain into Bristol Bay. The upland areas of these refuges and parks were closed to new mineral entry by Congress. These closures will prevent unnecessary conflict with upland management, prevent the filing of undevelopable mining claims and protect fishery and other resources. The streams and lakes to be closed are as follows: Pungokepuk Creek, Quigmy River, Ungalikthluk River, Negukthlik River, Kanik River, Snake River (part), Igushik River (part), Weary River (part), Longhorn Creek (part), Ongoke River (part), Goodnews River, Kanektok River (part), Middle Fork Goodnews River, South Fork Goodnews River, Dog Salmon River (part), Chignik River (part), Black Lake, Alec River, Clark River (part), Meshik River, Lake Clark, Chulitna River, Six Mile Lake, Naknek Lake, Naknek River (part), Nonvianuk Lake, Kukaklek Lake, Nonvianuk River (navigability in question), Alagnak (Branch) River (navigability in question - part), Aniakchak River

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(navigability in question), Becharof Lake, Upper Ugashik Lake, Lower Ugashik Lake, ~~and any additional streams in National Wildlife Refuges and National Parks determined to be navigable by the U.S. Bureau of Land Management~~ as well.

All sixty-four streams ~~and those within refuges~~ have significant surface uses which ~~would be~~ incompatible with mineral entry. State land in the southern addition to Wood-Tikchik State Park, described in Management Unit 5, would also be closed to mineral entry.

In addition, the plan requires that mining activities on state land in the watershed east of Iliamna Lake and in the Upper Mulchatna drainage (all state land in Management Units 9,10 and 11 and part of Unit 12) be subject to the state's leasehold location laws to ensure that mining activities do not adversely affect salmon reproduction. Valid existing mining claims are not affected by these restrictions.

The plan makes the following provisions for mineral exploration and development on all lands which are not closed to mineral entry by the plan or by previous state and federal legislation.

- A primary use designation for minerals has been placed on all state lands in the vicinity of known mineral terranes in the Upper Nushagak (Portions of Management Unit 8), Upper Mulchatna (Management Unit 9), eastern Iliamna lake (Management Unit 11), and Upper Kisaralik area (Management Unit 3).

- A secondary use designation for minerals has been placed on the remainder of available state lands in the study area.

- Additional inventory work will be undertaken by state and federal agencies to ascertain mineral potential on all lands in the study area.

- Plan ensures access to and across public lands for mineral development purposes.

- The plan recommends several land exchanges which provide for development of surface and subsurface resource potentials and protection of essential habitat lands for fish and wildlife. These exchanges are identified in Chapter IV.

- Goals and guidelines addressing minerals and materials were developed to aid mineral development in the study area and ensure that such development is completed in an environmentally sound manner.

Regional Goals and Guidelines - Minerals and Materials

Goal

Maintain opportunities to develop the region's mineral and material resources.

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Guidelines

1. Access Across Public Lands for Mineral Exploration and Development

   Land managers should ensure reasonable and necessary access to and across public lands for mineral exploration and development.

2. Mineral Exploration

   Recognized exploration methods for mineral location (i.e. core drilling and geochemical sampling) will be allowed on all state lands (excluding Wood-Tikchik State Park). Bulk sampling will not be allowed in areas closed to mineral entry. Further, bulk sampling will not be allowed in anadromous streams without a permit from ADF&G.

3. Dredge, Fill and Shoreline Alteration

   To avoid adverse impact on fish or fish habitat, dredging (including marine mining), filling, or shoreline alteration in fish habitat, barrier islands, spits, beaches, or tideflats will be allowed only where it is determined that the proposed activity will not have a significant adverse impact on fish or fish habitat or that no feasible and prudent alternative site exists to meet the public need. Existing community sources of gravel are exempt from this guideline.

4. Extracting Materials or Mining in or Adjacent to Fish Habitat

   Upland sites are the preferred source of sand and gravel. Extraction of sand and gravel from fish habitat will, to the extent feasible and prudent, be avoided.

   When selling sand and gravel on all public lands or issuing a permit for mining adjacent to or within fish habitat, the land manager will require as a condition of the sale or permit measures such as levees, berms, and/or settling ponds, and reclamation and rehabilitation measures that will, to the extent feasible and prudent, minimize the siltation and sedimentation of fish habitat.

Guidelines for Leases under DNR's Locatable Mineral Leasing System

The following guidelines apply only when DNR leases minerals under the state's locatable mineral leasing system. This system is only applied to a small portion of the state lands in the region. These guidelines reflect an agreement between DNR and ADF&G as to the appropriate lease requirements in the specific areas open to leasehold location north and east of Iliamna Lake and in the Upper Mulchatna drainage.

Guidelines regarding leasehold location will be amended to be consistent with leasehold location regulations that are in the process of being adopted by the Department of Natural Resources if the regulations are the same as,

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or vary only slightly from what is required here. Changing the plan to be consistent with these regulations will not require an amendment of the plan.

5. Mining Plan of Operation

An approved mining plan of operation will be required prior to the initiation of any operations on a mining lease that would otherwise require a Miscellaneous Land Use Permit (MLUP). The Director of the DNR Division of Minerals may make specific exceptions from this requirement for exploration operations of less than one years duration and minor impact by permitting such activities through an MLUP.

The plan of operations will address, but not be limited to, the following:

a. Location of the area to be mined. A map (1" - 1,000') will be required;
b. Time period of operation;
c. Size and purpose of the operation;
d. Number of pieces of equipment and people working on the project;
e. Methods to be utilized in overburden removal and storage, including blasting;
f. Amount of material to be handled, processed, or removed;
g. How the material will be processed;
h. How the tailings will be disposed of;
i. Waste water treatment and disposal;
j. Reclamation plan that describes activities which will be necessary, including: a time table for each step in the reclamation, a description of the measures to ensure that all debris and toxic materials are disposed of in a sound manner, and a description of the steps to be taken to comply with applicable water quality laws and statues;
k. The actions to be taken to minimize detrimental effects to fish and wildlife;
l. Water requirements (i.e., intended use of appropriated waters, sources and methods of obtaining water, rate of acquisition, design of wastewater treatment systems, and instream requirements);
m. Type and quantity of any elements or chemicals to be used in mining or mineral recovery;
n Plans for fuel transportation and storage;
o. Location and size of camp facilities and overland transportation; and
p. Anticipated restrictions on other surface uses of the lease area, including public access.

6. Coordination of Operating Plans and Water Rights

Approval of operating plans for mineral leases should be coordinated with issuance of a water right permit/ appropriation.

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7. Bonding

After consultation with ADF&G and DEC, DNR will determine the level of bonding required to administer or ensure compliance with the reclamation plan in the approved plan of operations.

8. Approval of Plans of Operation

DNR may approve plans of operation required for mineral leases if the plans adequately address the guidelines of the Bristol Bay Area Plan and DNR has consulted with and given careful consideration to the recommendations of ADF&G and DEC. Violation of the plan of operations is cause for enforced cessation of operations, if after a reasonable period of time a negotiated solution cannot be reached with the operator, or in the event of repeated violations.

9. Reclamation

Reclamation of mined areas will be required. At a minimum, topsoil must be removed separately and stored above the annual floodline; overburden must be disposed of above the limits of the annual floodline and may not be disposed of in fish bearing waters; and tailings must be graded at the close of each season to approximate the surrounding ground contours with the exception of tailings used in the construction of settling ponds and other essential facilities. At the cessation of mining activities, the lessee shall regrade all disturbed areas to stable slopes that blend with the natural topography, cover them with topsoil to allow revegetation and seed where necessary.

Guideline Cross Reference - Minerals and Materials

See - Guidelines for Environmental and Cultural Resources (page 2-6)
See - Instream Flow (page 2-11)
See - Buffers Adjacent to Fish Habitat (page 2-11)
See - Structures in Fish Habitat (page 2-13)
See - Heavy Equipment in Fish Habitat (page 2-13)
See - Water Intake Structures in Fish Habitat (page 2-13)
See - Stream Alteration (page 2-13)
See - Non-Oil and Gas Development and Caribou Calving Habitat (page 2-14)
See - Development and Willow Vegetation (page 2-15)
See - Activities in Essential Waterfowl Habitat (page 2-16)
See - Dredge and Fill in Essential Waterfowl Habitat (page 2-16)
See - Alteration of the Hydrologic System (page 2-16)
See - Development in Essential Brown Bear Habitat (page 2-17)
See - Activities that Disrupt the Use of Essential Marine Mammal and Marine Bird Habitats (page 2-18)
See - Activities Likely to Disturb Nesting Eagles (page 2-18)
See - Mineral Closures in Subdivisions and Homestead Areas (page 2-38)
See - Roads to Support Resource Development and Intercommunity Roads (page 2-40)

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See - Off Road Access (page 2-42)
See - Repeated Off Road Access in Essential Moose and Caribou Habitat (page 2-43)

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OIL AND GAS

Background

Two oil and gas provinces within the Bristol Bay area have some potential for exploration and possible discovery and development. These are the Bristol Bay Tertiary and the Alaska Peninsula Mesozoic Provinces. Twenty-six wells were drilled at various locations on the Alaska Peninsula between 1903 and 1981 and, while many had oil and/or gas shows, all were plugged and abandoned. An assessment in 1982 of the latest data by the Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys, concluded that Bristol Bay lands tend to be gas prone, with any deposit about twice as likely to be gas as oil; however, only small quantities of either resource are considered likely to be present.

The oil and gas basins found in upland areas continue offshore under the state-owned tide and submerged lands and into the federal Outer Continental Shelf (OCS). Most data indicate that the highest potential for discoveries of oil and gas within the region are in the state-owned tide and submerged lands and adjacent upland areas on the Bristol Bay side of the Alaska Peninsula. The National Petroleum Council (December 1981) estimates of undiscovered potentially recoverable hydrocarbons in the St. George Basin show a 47% chance of finding 1.2 billion barrels of oil or 5.6 trillion cubic feet of natural gas, and in the North Aleutian (Bristol) Basin 47% chance of finding 0.6 billion barrels of oil and 3.9 trillion cubic feet of natural gas. The USGS estimated that the recent St. George Basin OCS sale area northwest of Unimak Island may hold 1.1 billion barrels of recoverable oil and 3.7 trillion cubic feet of natural gas. These estimates, although based on very limited data, illustrate that there is some potential for oil and gas discoveries in the OCS.

Plan Provisions - Oil and Gas

The plan provides for the rational development of oil and gas resources by designating oil and gas as a primary use on state and Native lands in areas considered to have the most favorable potential for oil and gas discoveries. This includes over 3 million acres of state owned land on the Alaska Peninsula south of the Bristol Bay Borough. Oil and gas is designated as a secondary use on lands having moderate and low oil and gas potential, including the Nushagak Peninsula and the Nushagak and lower Kvichak River basins.

The plan provides for orderly development by placing its highest priority on upland oil and gas development. The Alaska State Legislature created the Bristol Bay Fisheries Reserve, which includes all shore lands and submerged lands which drain into the area bounded by Cape Menshikof on the south and Right Hand Point to the west, and prohibits surface entry for oil and gas activity in this area. Under the proposed plan the state would not schedule any oil and gas lease sales in the tide and submerged lands of the Fisheries Reserve (Management Subunit 1D). In addition, the plan recommends not leasing the tide and submerged lands west and north to Quinhagak, including

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Togiak and Goodnews Bay, which lie outside the known oil and gas basins, to protect the herring and salmon fisheries (Management Subunits 1A, 1B and 1C). The plan also recognizes that certain bays and lagoons provide essential habitat for fish, waterfowl and marine mammals. For this reason the state will not schedule oil and gas lease sales in the Cinder River Estuary, Port Heiden, Seal Islands Lagoon, Port Moller, Herendeen Bay, Nelson Lagoon, Izembek Lagoon, Moffet Lagoon or Bechevin Bay.

The remaining state tide and submerged lands south of Cape Menshikof (Management Subunits 1E and 1F) are placed in a category which provides for a 10 year (from 1984) delay before leasing. This delay provides time to determine what oil and gas resources might be available in the uplands, whether or not OCS areas will be leased offshore, and time to develop additional technology which may provide better protection of fishery resources during exploration and development activities.

The plan also provides guidelines for oil and gas development to ensure that it takes place in an environmentally sound manner on the upland areas.

Regional Goals and Guidelines - Oil and Gas

Goal

Maintain opportunities to explore and develop the region's oil and gas resources and opportunities to develop infrastructure needed to support oil and gas exploration and development.

Guidelines

1. Oil and Gas Pipelines

Pipelines and pipeline rights-of-way will, to the extent feasible and prudent, be sited, designed, constructed, and maintained to prevent risk to fish populations and spawning, rearing, and over wintering areas from a spill, pipeline break, or construction activities. Pipelines crossing fish-bearing waters will incorporate specific measures to minimize the amount of oil which may enter fish bearing waters as the result of a pipeline break.

2. Submarine Oil and Gas Pipelines

Permits, lease stipulations, or rights-of-way for submarine pipelines will, to the extent feasible and prudent, require that pipelines and well heads be buried deep enough or provide other protection or use other technology to prevent rupture by ship anchor or by fishing trawls.

3. Discharge of Drilling Muds

The discharge of drilling muds and produced water into marine waters will adhere to NPDES conditions and Alaska Coastal Management Program

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consistency requirements incorporated in or accompanying the NPDES permit. DEC Certificate of Assurance for NPDES permits will require discharges to have no significant, acute, or accumulative adverse impact on fish, wildlife, and aquatic plant resources. No discharges of drilling muds or produced waters will be permitted to fresh water lakes, streams or wetlands essential to waterfowl and fish.

4. Oil and Gas Facilities in Essential Waterfowl Habitat

All oil and gas production and storage and oil transportation facilities will, to the extent feasible and prudent, be located outside of essential waterfowl habitat, identified on Map 4 in Appendix A.

Guideline Cross Reference - Oil and Gas

See - Guidelines for Environmental and Cultural Resources (page 2-6)
See - Buffers Adjacent to Fish Habitat (page 2-11)
See - Wetlands Identification and Protection (page 2-13)
See - Structures in Fish Habitat (page 2-13)
See - Heavy Equipment in Fish Habitat (page 2-13)
See - Water Intake Structures in Fish Habitat (page 2-13)
See - Stream Alteration (page 2-13)
See - Use of Explosives in Fresh and Marine Waters (page 2-14)
See - Seasonal Restrictions of Oil and Gas Development in Caribou Calving Habitat (page 2-14)
See - Blasting in Caribou Wintering and Calving Habitat (page 2-15)
See - Guidelines to Prevent Moose Habitat Alterations and Destruction (page 2-15)
See - Guidelines to Prevent Waterfowl Disturbances, Habitat Alteration and Destruction, and Impacts on Harvest of Waterfowl (page 2-16)
See - Guidelines to Prevent Brown Bear Habitat Alteration and Destruction (page 2-17)
See - Guidelines to Prevent Marine Mammal and Marine Bird Habitat Alteration and Destruction (page 2-18)
See - Activities Likely to Disturb Nesting Eagles (page 2-18)
See - Roads to Support Resource Development and Intercommunity Roads (page 2-40)
See - Preferred Trans-Peninsula Corridors (page 2-40)
See - North-South Corridors on the Alaska Peninsula (page 2-41)
See - Stream Crossings (page 2-41)
See - Bridges and Culverts (page 2-42)
See - Off Road Access (page 2-42)
See - Winter Roads and Winter Access Over Rivers, Lakes, and Streams (page 2-42)
See - Fixed Wing Aircraft and Helicopters (page 2-42)
See - Above Ground Pipelines (page 2-43)
See - Repeated Off Road Access in Essential Moose and Caribou Habitat (page 2-43)
See - Road Construction in Essential Moose or Brown Bear Habitat (page 2-44)

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RECREATION

Background

The Bristol Bay region has long been known by sportsmen for its trophy fishing and big game hunting opportunities. A number of guiding operations use the Bristol Bay area, with most of the activity concentrated in the spring, summer, and fall months. Sport fishermen in 1980 harvested about 37,000 salmon, and fishing for trophy rainbow trout and grayling is very popular. Sport hunting for big game species such as brown bear, moose, and caribou occurs throughout much of the area. Congressionally designated wild and scenic rivers in the region or in adjacent parks, as well as other non-designated rivers, have become increasingly popular for river floating. The area contains many commercial lodges catering to hunters and fishermen; recreational cabins and campsites are also spread throughout. Maintained and unmaintained airstrips abound, and floatplanes make use of the lakes and larger rivers. Wood-Tikchik State Park is the largest of Alaska's state parks and provides high quality fishing and boating. Three national parks or monuments (Lake Clark, Katmai, and Aniakchak) adjoin the planning area. Katmai National Park and Preserve was established because of its unique geologic and wildlife resources. These parks, the national wildlife refuges and recreational rivers and lakes all attract increasing numbers of recreationists from around the world.

Plan Provisions - Recreation

The plan identified recreation as a primary use on public lands in management units 3 through 22, 24, 30, and 31, and as a secondary use on most other public lands with recreational values. Recreation guidelines address the maintenance of recreational resources and recreation management plans. Alaska Department of Fish and Game has also compiled a listing of public recreational access sites in the Bristol Bay area that the State should acquire for public use.

Regional Goals and Guidelines - Recreation

Goal

> Maintain a range of recreational, scenic, educational, wilderness, and unique natural resources in the Bristol Bay region adequate to provide for the needs of local residents, and state and national users.

Guidelines

1. Future Management Plans Should Address Recreation

   State agencies should develop management plans that maintain public recreation, scenic areas, wilderness, unique geological features, and fragile or unique ecosystems in areas with significant recreation values.

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2. Recreation Facility Siting

Recreation facilities will be sited in a manner to minimize the adverse impact on existing wildlife populations and traditional uses while at the same time providing the recreation facilities needed by the public.

Guideline Cross Reference - Recreation

See - Historic and Cultural Resources (page 2-6)
See - Water Quality (page 2-7)
See - Public Notice (page 2-7)
See - Public Access (page 2-16)
See - Public Ownership of Essential Waterfowl Habitat (page 2-17)
See - Development in Essential Brown Bear Habitat (page 2-17)
See - Traditional Public Access (page 2-41)

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SETTLEMENT

Background

Community expansion and remote residential developments place a demand on communities, Native corporations, and the state and federal governments to provide land for development. The Alaska Native Claims Settlement Act (ANCSA) and Alaska Statehood Act have revolutionized the concepts of landownership in the Bristol Bay region. Village Native corporations and municipalities will provide most of the land to meet the needs of growing communities for residential, commercial, or industrial development. Section 14(c) (3) of ANCSA will provide municipalities 1,280 acres (more or less) of land from the village Native corporations to accommodate future community needs for land. Native corporations are also providing land to their shareholders, and some have developed subdivisions.

Remote settlement, outside of traditional villages, has been limited in the region. Many lodges and camps were established under the Bureau of Land Management's Trade and Manufacturing Sites program, when most land in the region was federally owned and managed. Only a few homesteads were successfully established, and, with the exception of lodges, there are few year-round residences outside the villages. Many camps and a few lodges are also situated on individual Native Allotments. Only one area has been offered for sale for remote settlement under the state's land disposal programs. This area is located near Warehouse Mountain, just outside Dillingham.

Plan Provisions - Settlement

The plan provides for community expansion through the use of community lands and existing private lands (including Native corporation lands). In addition, the plan proposes state land disposals in areas where the land sales will have the least adverse impact on fishery, recreation and subsistence resources. Several areas have been identified as being most appropriate for up to 14,000 acres of state land sales, primarily for recreational purposes, over the next ten years. These disposals are primarily located around the regional center of Dillingham, the Iliamna Lake area, and the southern peninsula area in the vicinity of Port Moller and Cold Bay.

The plan gives the Department of Natural Resources the authority to determine specific acreages to be sold in some disposal areas. The plan also recommends that DNR sell land in the Iliamna Lake and lower peninsula areas in a specified sequence to minimize the impacts of disposals on local residents. The plan does not require that the DNR sell 14,000 acres. If demand for disposals decreases or private land sales increase to meet demand, the state could decrease the amount of land sold.

Specific areas which may be sold are as follows (these are described in greater detail in the appropriate management units and the Settlement Element):

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Management Unit ~~11~~ 5 - Dillingham Area - The state may sell up to 8500 acres from seven (7) disposal areas:

Snake Lake
Land Otter Creek
Warehouse Mountain (re-offering)
Wood River/Aleknagik Road (scattered parcels)
Weary River
Snake River
Etolin Point

Management Unit ~~9~~ 7 - Half Cabin Lakes - 500 acres not to be sold before 1989.

Management Units ~~10~~ 8, ~~11~~ 9, ~~12~~ 10 - (Iliamna Lake Area) - 3,000 acres recommended to be sold in the following order and not to exceed the listed acreages:

#1	Newhalen River and/or Chekok Lake - 2 Sites	1,250 Acres
	If access to the Newhalen River parcel is unattainable, up to 500 acres could be shifted to other parcels in the Iliamna Lake area. Only 500 acres should be offered at either site in the first disposal.	
#2	Kokhanok/Moose Lakes (Not before 1989)	1,000 Acres
#3	~~Reindeer Bay~~ Big Mountain (Not before 1989)	750 Acres

Management Units ~~22~~ 16 and ~~26~~ 20 - 1,000 acres between 3 sites, not to exceed 500 acres at the Port Moller site and recommended to be sold in the following order:

#1 American and Dorenoi Bays
#2 Port Moller

Management Unit ~~30~~ 22 - Cold Bay - 1,000 acres, most of which should be on land to be acquired from USFWS by exchange.

The plan allows DNR to issue up to 50 permits for the construction of trapper's cabins throughout the area. The plan prohibits the issuance of remote cabin permits under AS 38.05.079 on any lands in the region.

Regional Goals and Guidelines - Settlement

Goal

Provide opportunities for the expansion of existing communities and recreational or remote homesite settlement that meets current and projected demand for private land while avoiding significant adverse impacts on other important resources and users.

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Guidelines

1. Lands That Can Be Sold

The plan identifies those public lands in Bristol Bay that can be sold or opened for settlement under the state's land disposal programs (e.g., homesteads, homesites, remote parcels, subdivision) during the ten years following adoption of this plan. For the DNR to sell or open land for settlement in different areas of Bristol Bay or to increase the amount of land to be opened or sold in allocated disposal areas, except as specifically allowed in the plan, will require an amendment of the plan. Agriculture disposals are not allowed.

Where workforce sites to facilitate commercial or industrial development, such as mining, fish processing, energy development, etc., are needed they may be allowed without amendment of the plan under appropriate federal or state regulations. Where significant conflicts with traditional uses are likely, a lease for enclave type development should be considered as an alternative to fee simple disposal. High density land disposals such as for work force sites in caribou or brown bear habitat, identified on Maps 2 and 5 in Appendix A, are considered a significant conflict. Therefore, work force sites in these habitats will, to the extent feasible and prudent, be leased and enclave development required.

2. Coordination With Municipalities and Native Corporations

The DNR will consult with municipalities and Native corporations wishing to coordinate their land disposals in order to make the most suitable land available for community expansion, private recreation, and remote residential uses regardless of present ownership; and also, to coordinate the timing of disposals to best meet the demand of people in and outside the region.

3. Coordination With Coastal Resource Service Area Boards

The DNR will coordinate with the appropriate Coastal Resource Service Area board in determining 1) the market for state and federal land, 2) the type of disposal that meets the needs of the people in the area; and, 3) the placement within the designated disposal area, and the timing and design of the disposals allowed by the plan. Also, the DNR should continue, and further emphasize, its present policy of seeking advice on the design, timing, size, and method of disposal from communities and Native corporations owning land nearest the proposed disposal.

As part of the planning process, the effect of the disposal of state lands identified in this plan on the density of the population in the vicinity and on traditional uses of the land has been considered as required in AS 38.05.301. State land selected for disposal are those lands determined to have the least impact on traditional uses and to be

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where additional population will have the least impact. The plan's guidelines in part fulfill the requirement to develop a plan to resolve or mitigate conflicts. Where necessary, additional provision will be made on a case-by-case basis to resolve or mitigate remaining conflicts such as reservations of corridors for existing trails.

4. Use of Existing Services

Public land disposal projects allowed by the plan should be designed to maximize the use of existing services and infrastructure, and will provide adequate open space to maintain public access and provide for public use and other important resources.

5. Transportation Related to Land Sales

The local, borough, state, and federal governments should cooperate to provide for reasonable local and regional transportation needs resulting from public land disposals.

6. ADNR Assistance to Local Communities

Local municipalities are encouraged to sell their lands to help satisfy demand for additional private ownership in the Bristol Bay region. As part of this encouragement, DNR should work with the Department of Community and Regional Affairs (DCRA) and municipalities to either amend AS 38.04.021 or get official interpretation that is possible to: 1) allow grants for survey and other improvements to be applied to community lands that were not previously state-owned lands; 2) allow such grants to be made to the trustee for future municipalities.

Municipalities may apply to DNR under AS 38.04.021 for financial assistance to carry out a land disposal program. At a minimum, DNR should provide technical advice to municipalities requesting it. As staff time is available, DNR should provide technical assistance with land sales to municipalities or trustees for future municipalities that request it.

7. Land Sales in Essential Brown Bear Habitat

Public land designated essential brown bear habitat, identified on Map 5 in Appendix A, will, to the extent feasible and prudent, be retained in public ownership.

8. Mineral Closures in Subdivisions and Homestead Areas

Land sold as state subdivisions will be closed to new mineral entry and location. The closing order will be signed during the disposal process, and only cover the project area. State lands open for homesteading will be closed to new mineral entry and location during the disposal process. These areas will remain closed to new mineral entry and location until the maximum number of homestead entries

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allowed has been reached. Only at that time will lands not homesteaded be re-opened for mineral entry and location.

9. Trapping Cabins

Trapping cabins are allowed on state land in the Bristol Bay study area subject to the following conditions:

a. A maximum of 50 permits may be issued during the ten years following adoption of the plan.

b. No commercial use of the cabins is allowed except trapping.

c. No residential use of the cabins is allowed.

d. Prior to issuing a permit, the application will be circulated for normal interagency review. The local CRSA board (or other regional government in place at the time) will be included in this review.

e. A permit will allow more than 1 cabin only if a clear need for more than 1 is demonstrated to the satisfaction of the Director of Land and Water Management, DNR.

Guideline Cross Reference - Settlement

See - Public Notice (page 2-7)
See - Buffers Adjacent to Fish Habitat (2-11)
See - Public Access (page 2-16)
See - Public Ownership of Essential Waterfowl Habitat (page 2-17)
See - Development in Essential Brown Bear Habitat (page 2-17)
See - Local Use of Forest Products (page 2-20)
See - Recreation Facility Siting (page 2-33)
See - Traditional Public Access (page 2-41)
See - Stream Crossings (page 2-41)
See - Bridges and Culverts (page 2-42)

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TRANSPORTATION

Background

No road access exists from outside the Bristol Bay area. Airplane and boat are still the primary modes of transportation used for access into the region. Only three intercommunity roads exist, but during the winter, travel can occur between most communities by snow machine or all-terrain vehicles. Most communities have a small gravel runway for access. The major air and water transportation centers in the region are at Dillingham, King Salmon, and Cold Bay.

Plan Provisions - Transportation

The proposed plan takes steps to aid the development of the region's transportation system when necessary to support resource development.

Specifically, the plan provides for access across state land on the Alaska Peninsula by identifying three preferred trans-peninsula routes. These could be used to transport oil or gas from the lease sale areas on the north side of the peninsula or OCS sale areas in the Bering Sea to deepwater ports on the Pacific Ocean and could provide for general transportation and freight transport across the Alaska Peninsula. The plan requires that DNR and USFWS pursue a cooperative agreement by which, to the extent legally allowed, land managers will avoid actions which may preclude the use of these corridors or potential port sites at their Pacific Ocean terminus. These corridors could be used for pipelines, roads, transmission lines, and transportation or utility systems. A road corridor is also identified from King Cove to Cold Bay. Actual design and construction of transportation facilities across national conservation system units would be subject to the provisions of Title XI of ANILCA. This process could be used to establish alternative routes to those preferred by the plan through conservation system units.

The following are the general routes identified for these corridors:

Port Moller to Balboa Bay: This corridor runs from the Bering Sea through Portage Valley to Lefthand Bay on Balboa Bay. Several other routes were considered as alternatives to this preferred route, including corridors that terminated at Beaver Bay and Dorenoi Bay. The port site would be on Balboa Bay.

Port Heiden to Kujulik Bay: The corridor begins near Port Heiden, leads southwest to near the base of Aniakchak Crater, and follows the Meshik River Valley. The corridor goes east and then south to Kujulik Bay. This corridor avoids crossing Aniakchak National Preserve. An alternate route (through Aniakchak National Preserve) would run over a low divide in the Aniakchak River Valley to Aniakchak Bay. The port site would be on the north side of Kujulik Bay.

Pilot Point to Wide Bay: The corridor begins near Pilot Point on Ugashik Bay and runs southeast, crossing the Ugashik River near Ugashik village. It

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continues on the coastal plain north of the Dog Salmon River to south of Ugashik Lake. The corridor continues on past Lone Hill to Wide Bay. The port site would be located on Wide Bay.

King Cove to Cold Bay road: A 32-Mile road to connect the communities of King Cove and Cold Bay could be considered for construction if economically and environmentally feasible.

The plan also allows for alternate corridors and for connector lines to these corridors, and allows roads and other transportation required to support resource development. The plan discourages intercommunity roads unless local communities want them. The plan also designates transportation (which includes pipelines) as a secondary use in Management Unit 1, most tide and submerged lands of the area.

In order to aid oil development on the Alaska Peninsula, the plan also ensures that connecting pipeline corridors up and down the Bristol Bay side of the peninsula are allowed as necessary.

Regional Goals and Guidelines - Transportation

Goal

Support resource development and local transportation needs in the region by reserving preferred transportation corridors and port sites.

Guidelines

1. Roads to Support Resource Development and Intercommunity Roads

   Roads and other transportation can be developed to support resource exploration and development and community expansion. Inter-community roads are discouraged except where: 1) communities are close together, 2) alternate transportation options would be more costly and less dependable, and, 3) there is strong local support.

2. Preferred Trans-peninsula Corridors

   When future trans-peninsula pipeline, road, or other transportation developments are planned, developers should consider using the preferred corridors identified. More detailed route alignment and feasibility analysis will be required before any of these routes is chosen for transportation development. Public land managers will to the extent legally allowed avoid actions such as land sales or recommending wilderness designations that preclude or impede the construction of pipelines, roads, or other transportation development in these corridors until such time as a final decision is made on the feasibility or appropriateness of the routes.

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Furthermore, identification of preferred corridors by the plan is not intended to foreclose other options that turn out to be preferable when transportation needs are more clearly defined. These other options may include those corridors which were considered during the planning process.

3. Title XI of ANILCA

Any transportation or utility systems that cross National Conservation System Units are subject to Title XI of ANILCA. Title XI of ANILCA covers transportation and utility systems in and across, as well as access into, federal conservation system units (including NWRs). Specific regulations can be found in the interim management regulations published as 50 CFR 36 in the Federal Register, Vol. 46, No. 116, dated June 17, 1981.

4. North-South Corridors on the Alaska Peninsula

North-south corridors to support resource development or to connect with the appropriate trans-peninsula corridors are an allowed use on state land on the north side of the Alaska Peninsula.

5. Traditional Public Access

Traditional public access through federal, state, or private land should be maintained or enhanced in the Bristol Bay plan area. If area-specific restrictions are necessary on state lands, public review of restricted methods and areas should be part of the closure process.

Elements of public access include site-specific aspects such as roads, waterways, trails, campsites, and aircraft landing areas, as well as methods of transport such as mechanized land, water, and air transportation. Traditional means include, but are not limited to, aircraft, ORV, boat, snowmachine, dogsled, and foot.

6. Transmission Lines

Transmission lines will use existing or preferred transportation corridors where feasible and prudent. The siting and construction of transmission lines will, to the extent feasible and prudent, avoid creating new permanent access corridors and causing significant damage to the land surface.

7. Stream Crossings

To prevent siltation or pollution of fish habitat, roads and pipelines should cross rivers, streams, or lakes only when absolutely necessary, and crossings should be at right angles to the waterbody. Gravel fill ramps and bridges or other appropriate methods should be used to protect the banks.

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8. Bridges and Culverts

All bridges and culverts on fish-bearing streams will be large enough and positioned to avoid changing the direction and velocity of stream flow up to and including annual flood conditions or otherwise interfere with the migration or spawning activities of fish unless the land manager or in streams where a Title 16 permit is required, the ADF&G, determines deviation from this guideline will not have a significant impact on fish resources. In addition, all bridges and culverts will, to the extent feasible and prudent, be large enough to accommodate the best available estimate of the 25-year peak discharge without significantly interfering with volume, velocity, and sediment transport or substrate characteristics of the stream where these properties are important to the uses of the stream. Bridges and culverts should provide adequate clearance at normal summer flow levels for boat, pedestrian, and large game passage whenever these uses occur or are anticipated.

9. Off Road Access

Permits for temporary off road access will require that surface disturbance and destruction of fragile soils and wetlands vegetation be minimized. Operations should be scheduled when adequate snow and ground frost is available to protect the ground surface, or require the use of low ground pressure vehicles, avoidance of problem areas, or other techniques to protect areas likely to be damaged by off road access.

10. Winter Roads and Winter Access Over Rivers, Lakes and Streams

For winter roads or winter access, snow ramps, snow bridges, cribbing, or other methods should be used to provide access across frozen rivers, lakes, or streams to avoid the cutting, eroding, or degrading of banks. Snow bridges will be removed or breached and cribbing will be removed immediately after final use.

11. New Public Roads or Utilities in Caribou Migration Route

Any new public roads or utility lines connecting communities in the Bristol Bay study area should parallel or skirt and not cross caribou migration routes, identified on Map 2 in Appendix A.

12. Fixed Wing Aircraft and Helicopters

When a land manager issues a lease or permit for a major development requiring repeated fixed-wing aircraft or helicopter support, the developer will be encouraged to maintain above-ground flight altitudes of at least 1,000 feet for fixed-wing aircraft, and 1,500 feet for helicopters, or a horizontal distance of one mile, when flying over the following essential habitats during designated times:

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- caribou calving, May 1 - June 15 north of the Kvichak River and Iliamna Lake and May 7 - June 15 south of the Kvichak River and Iliamna Lake. (Map 2, Appendix A);
- waterfowl high spring use, April 7 - May 20 (Map 4, Appendix A);
- waterfowl high fall use, August 20 - November 15 (Map 4, Appendix A);
- walrus haulout areas, April 1 - November 30 (Map 3, Appendix A);
- sea lion haulout areas, May 1 - July 31 (Map 3, Appendix A)
- marine bird colonies, April 15 - August 31 (Map 4, Appendix A);
- and active eagle nest sites, April 15 - August 31 (Map 4, Appendix A).

For caribou, restrictions need only be followed when and where the ADF&G determines there are significant numbers present. For eagles, restrictions need only be followed when and where USFWS determines significant numbers are present. The safety of pilot and passengers will take precedence over this guideline.

13. Above-Ground Pipelines

Above-ground pipelines should be sited between or at the periphery of the habitats of the major Bristol Bay caribou herds, identified on Map 2 in Appendix A, and should avoid essential and important moose habitat, identified on Map 3 in Appendix A.

If pipelines must cross essential caribou habitat or essential or important moose habitat, the pipeline will, to the extent feasible and prudent, be buried wherever soil and geophysical conditions permit. Pipelines that cannot avoid essential caribou or moose habitat and cannot be buried due to soil or geophysical conditions, will be designed and constructed in a manner that has been demonstrated to provide free movement and safe passage for caribou and moose.

In essential caribou habitat, heavily used service and public roads should be sited as far as is practical from elevated pipelines to avoid additional visual and physical barriers to caribou migration.

This guideline is not intended to give priority to one of the identified preferred corridors over another of the identified preferred corridors.

14. Repeated Off Road Access in Essential Moose and Caribou Habitat

Repeated Off Road Vehicle (ORV) use regulated by permit will to the extent feasible and prudent not be allowed in caribou calving habitat and during caribou calving (May 1 through June 15 north of the Kvichak River and Iliamna Lake and May 7 through June 15 south of the Kvichak River and Iliamna Lake) and should be restricted in caribou migration and caribou and moose over-wintering areas during sensitive periods, identified on Maps 2 and 3 in Appendix A. (This guideline does not

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apply to local traffic and traditional hunting activities.) Before issuing permits the land manager will consult with the ADF&G and restrictions need be applied only when and where it is determined that there are significant populations present.

15. Road Construction in Essential Moose or Brown Bear Habitat

Road construction outside existing communities will, to the extent feasible and prudent, avoid essential and important moose and brown bear habitat, identified on Maps 3 and 5 in Appendix A. Where it is not feasible and prudent to avoid essential and important moose or brown bear habitat, roads should be sited, designed, and constructed to minimize conflicts with moose, brown bear, and moose and brown bear habitat.

16. Transmission Lines in Essential Waterfowl Habitat

To the extent feasible and prudent, transmission lines and towers will not be sited in essential waterfowl habitat, identified on Map 4 in Appendix A. Transmission lines should be sited a minimum of one mile inland from the coast, or buried, to avoid coastal waterfowl movements. Transmission lines that must cross the Alaska Peninsula at Morzhovoi Bay, Cold Bay, Pavlof Bay, Chignik Bay, and Wide Bay should be sited and designed to minimize the potential for waterfowl collisions during darkness and bad weather.

17. Transmission Lines and Conflicts With Raptors

Transmission lines will be constructed so as to prevent electrocution of eagles and peregrine falcons and will, to the extent feasible and prudent, be sited a minimum of 500 feet away from eagle and other raptor nest sites, identified on Map 4 in Appendix A.

Guideline Cross Reference - Transportation

See - Water Quality (page 2-7)
See - Public Notice (page 2-7)
See - Buffers Adjacent to Fish Habitat (page 2-11)
See - Wetlands Identification and Protection (page 2-13)
See - Structures in Fish Habitat (page 2-13)
See - Stream Alteration (page 2-13)
See - Non-Oil and Gas Development and Caribou Calving Habitat (page 2-14)
See - Guidelines to Prevent Moose Habitat Alteration and Destruction (page 2-15)
See - Guidelines to Prevent Waterfowl Habitat Alteration and Destruction, and Impacts to Waterfowl Harvest (page 2-16)
See - Development in Essential Brown Bear Habitat (page 2-17)
See - Guidelines to Prevent Marine Mammal and Marine Bird Habitat Alteration and Destruction (page 2-18)
See - Activities Likely to Disturb Nesting Eagles (page 2-18)
See - Transportation Related to Land Sales (page 2-37)

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STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
BRISTOL BAY AREA PLAN
MINERAL ORDER NO. 393

____ - - Opening Lands to Mineral Entry

XX - - Closing Lands to Mineral Entry

Pursuant to authority granted to the Director, Division of Lands, State of Alaska, by AS 38.05.185 thru AS 38.05.280, and in accordance with applicable regulations, the Director does hereby XX close ____open the following described lands to entry under the locatable mineral leasing and mining laws of the State of Alaska:

SEE ATTACHMENT #1

Subject to valid existing rights.

This mineral order is based on written justification contained in Land Planning Report C-SC-84-008 and the BBAP.

Submitted: Rick Austin for
District Classification Officer

Concur: Margaret J Haye
District Manager

Mineral Order Recommended: RVG 9/12/84
Division Classification Officer

Concur: Tom Hawkins 9-12-84
Director,
Division of Land and Water Management

Approved by: Esther C Wunnicke
Commissioner
Department of Natural Resources

9-13-84
Effective
Date

PLAINTIFF
EXHIBIT NO. 877
ADMITTED ☐
3AN-09-9173 CI
(CASE NUMBER)

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ATTACHMENT 1

BRISTOL BAY AREA PLAN TOWNSHIP
INDEX OF STREAM MINERAL CLOSURES

TOWNSHIP/RANGE	RIVER(S)	ANADROMOUS STREAM IDENTIFICATION NUMBER	CLOSED ACREAGE**
* T.1N., R.32W. S.M.	Chulitna River	324-10-10150-2207-3173	100
T.1N., R.41W. S.M.	Mulchatna River	325-30-10100-2202	2,462
T.1N., R.43W. S.M.	Old Man Creek	325-30-10100-2202-3075	288
T.1N., R.46W. S.M.	Nushagak River	325-30-10100	1,981
T.2N., R.37W. S.M.	Keefer Creek	325-30-10100-2202-3338	69
T.2N., R.38W. S.M.	Keefer Creek	325-30-10100-2202-3338	288
T.2N., R.39W. S.M.	Keefer Creek	325-30-10100-2202-3338	251
T.2N., R.40W. S.M.	Mulchatna River	325-30-10100-2202	1,221
T.2N., R.41W. S.M.	Mulchatna River	325-30-10100-2202	1,012
T.2N., R.46W. S.M.	King Salmon River Nushagak River	325-30-10100-2435 325-30-10100	1,733
T.2N., R.47W. S.M.	Nushagak River King Salmon River	325-30-10100 325-30-10100-2435	4,389
T.2N., R.48W. S.M.	King Salmon River Tributary to King Salmon	325-30-10100-2435 325-30-10100-2435-3100	2,683
T.2N., R.49W. S.M.	King Salmon River Tributary to King Salmon	325-30-10100-2435 325-30-10100-2435-3100	76
T.2N., R.50W. S.M.	King Salmon River	325-30-10100-2435	380
T.3N., R.35W. S.M.	Nikadavna Creek	325-30-10100-2202-3446-4052	153
T.3N., R.37W. S.M.	Tributary to Mulchatna	325-30-10100-2202-3420	248
T.3N., R.39W. S.M.	Mulchatna River Keefer Creek	325-30-10100-2202 325-30-10100-2202-3338	3,197
T.3N., R.40W. S.M.	Mulchatna River	325-30-10100-2202	1,714
T.3N., R.46W. S.M.	Nushagak River	325-30-10100	630
T.3N., R.48W. S.M.	Tributary to King Salmon	325-30-10100-2435-3100	127
T.3N., R.49W. S.M.	King Salmon River Tributary to King Salmon Tributary to King Salmon Tributary to King Salmon Tributary to King Salmon	325-30-10100-2435 325-30-10100-2435-3100 325-30-10100-2435-3116 325-30-10100-2435-3116-4011 325-30-10100-2435-3130	1,589
T.3N., R.50W. S.M.	King Salmon River Tributary to King Salmon Tributary to King Salmon	325-30-10100-2435 325-30-10100-2435-3116-4011 325-30-10100-2435-3130	566
T.3N., R.51W. S.M.	King Salmon River	325-30-10100-2435	338
T.3N., R.52W. S.M.	King Salmon River	325-30-10100-2435	314
T.4N., R.33W. S.M.	Chilchitna River	325-30-10100-2202-3446	94

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TOWNSHIP/RANGE	RIVER(S)	ANADROMOUS STREAMS IDENTIFICATION NUMBER	CLOSED ACREAGE**
T.4N., R.34W. S.M.	Chilchitna River	325-30-10100-2202-3446	418
T.4N., R.35W. S.M.	Nikadavna Creek Chilchitna River	325-30-10100-2202-3446-4052 325-30-10100-2202-3446	386
T.4N., R.36W. S.M.	Chilchitna River Nikadavna Creek	325-30-10100-2202-3446 325-30-10100-2202-3446-4052	324
T.4N., R.37W. S.M.	Mulchatna River Tributary to Mulchatna	325-30-10100-2202 325-30-10100-2202-3420	1,110
T.4N., R.38W. S.M.	Mulchatna River	325-30-10100-2202	1,372
T.4N., R.39W. S.M.	Mulchatna River	325-30-10100-2202	34
T.4N., R.42W. S.M.	Nushagak River	325-30-10100	51
T.4N., R.43W. S.M.	Nushagak River	325-30-10100	919
T.4N., R.45W. S.M.	Nushagak River	325-30-10100	1,061
T.4N., R.46W. S.M.	Nushagak River	325-30-10100	193
T.4N., R.48W. S.M.	Tributary to King Salmon	325-30-10100-2435-3100	94
T.4N., R.49W. S.M.	Tributary to King Salmon	325-30-10100-2435-3116	193
T.5N., R.30W. S.M.	Chilikadrotna River	325-30-10100-2202-3510	129
T.5N., R.31W. S.M.	Chilikadrotna River	325-30-10100-2202-3510	207
T.5N., R.32W. S.M.	Chilchitna River	325-30-10100-2202-3446	178
T.5N., R.33W. S.M.	Chilchitna River	325-30-10100-2202-3446	105
T.5N., R.35W. S.M.	Chilchitna River Mulchatna River	325-30-10100-2202-3446 325-30-10100-2202	308
T.5N., R.36W. S.M.	Mulchatna River Chilchitna River	325-30-10100-2202 325-30-10100-2202-3446	1,806
T.5N., R.37W. S.M.	Mulchatna River	325-30-10100-2202	19
T.5N., R.42W. S.M.	Nushagak River	325-30-10100	401
T.5N., R.43W. S.M.	Nushagak River	325-30-10100	466
T.5N., R.44W. S.M.	Nushagak River	325-30-10100	673
T.6N., R.30W. S.M.	Chilikadrotna River	325-30-10100-2202-3510	233
T.6N., R.31W. S.M.	Chilikadrotna River	325-30-10100-2202-3510	173
T.6N., R.32W. S.M.	Chilikadrotna River	325-30-10100-2202-3510	668
T.6N., R.33W. S.M.	Chilikadrotna River	325-30-10100-2202-3510	298
T.6N., R.34W. S.M.	Mulchatna River Chilikadrotna River	325-30-10100-2202 325-30-10100-2202-3510	594
T.6N., R.35W. S.M.	Mulchatna River Chilikadrotna River	325-30-10100-2202 325-30-10100-2202-3510	1,273
T.6N., R.39W. S.M.	Nushagak River	325-30-10100	244
T.6N., R.40W. S.M.	Nushagak River	325-30-10100	379

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TOWNSHIP/RANGE	RIVER(S)	ANADROMOUS STREAMS IDENTIFICATION NUMBER	CLOSED ACREAGE**
T.6N., R.41W. S.M.	Nushagak River	325-30-10100	424
T.6N., R.42W. S.M.	Nushagak River	325-30-10100	229
T.7N., R.33W. S.M.	Mulchatna River	325-30-10100-2202	238
T.7N., R.34W. S.M.	Mulchatna River	325-30-10100-2202	609
T.7N., R.39W. S.M.	Nushagak River	325-30-10100	29
T.8N., R.32W. S.M.	Mulchatna River	325-30-10100-2202	215
T.8N., R.33W. S.M.	Mulchatna River	325-30-10100-2202	313
T.9N., R.30W. S.M.	Mulchatna River	325-30-10100-2202	897
T.9N., R.31W. S.M.	Mulchatna River	325-30-10100-2202	538
T.9N., R.32W. S.M.	Mulchatna River	325-30-10100-2202	263
T.1S., R.41W. S.M.	Mulchatna River	325-30-10100-2202	2,544
T.1S., R.43W. S.M.	Old Man Creek	325-30-10100-2202-3075	342
T.1S., R.44W. S.M.	Old Man Creek	325-30-10100-2202-3075	98
T.1S., R.47W. S.M.	Nushagak River	325-30-10100	2,627
* T.2S., R.29W. S.M.	Chekok Creek	324-10-10150-2267	25
T.2S., R.40W. S.M.	Koktuli River	325-30-10100-2202-3080	600
T.2S., R.41W. S.M.	Koktuli River Mulchatna River	325-30-10100-2202-3080 325-30-10100-2202	527
T.2S., R.42W. S.M.	Mulchatna River Old Man Creek	325-30-10100-2202 325-30-10100-2202-3075	3,269
T.2S., R.43W. S.M.	Old Man Creek	325-30-10100-2202-3075	198
T.2S., R.45W. S.M.	Harris Creek	325-30-10100-2280	182
T.2S., R.46W. S.M.	Harris Creek	325-30-10100-2280	324
T.2S., R.47W. S.M.	Harris Creek Nushagak River	325-30-10100-2280 325-30-10100	3,931
* T.3S., R.26W. S.M.	Pile River Tributary to Iliamna River	324-10-10150-2341 324-10-10150-2402-3025	123
T.3S., R.29W. S.M.	Chekok Creek	324-10-10150-2267	211
* T.3S., R.30W. S.M.	Chekok Creek	324-10-10150-2267	58
* T.3S., R.32W. S.M.	Newhalen River	324-10-10150-2207	107
* T.3S., R.33W. S.M.	Newhalen River	324-10-10150-2207	1,120
T.3S., R.34W. S.M.	Upper Talarik Creek	324-10-10150-2183	153
T.3S., R.35W. S.M.	Upper Talarik Creek Tributary to Koktuli R.	324-10-10150-2183 325-30-10100-2202-3080-4083	116
T.3S., R.36W. S.M.	Tributary to Koktuli R.	325-30-10100-2202-3080-4083	379
T.3S., R.37W. S.M.	Tributary to Koktuli R.	325-30-10100-2202-3080-4083	72

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TOWNSHIP/RANGE	RIVER(S)	ANADROMOUS STREAMS IDENTIFICATION NUMBER	CLOSED ACREAGE**
T.3S., R.38W. S.M.	Koktuli River	325-30-10100-2202-3080	344
T.3S., R.39W. S.M.	Koktuli River	325-30-10100-2202-3080	
	Tributary to Koktuli R.	325-30-10100-2202-3080-4058	961
T.3S., R.40W. S.M.	Koktuli River	325-30-10100-2202-3080	21
T.3S., R.41W. S.M.	Koktuli River	325-30-10100-2202-3080	168
T.3S., R.42W. S.M.	Mulchatna River	325-30-10100-2202	
	Koktuli River	325-30-10100-2202-3080	
	Old Man Creek	325-30-10100-2202-3075	2,384
T.3S., R.43W. S.M.	Mulchatna River	325-30-10100-2202	342
T.3S., R.45W. S.M.	Cranberry Creek	325-30-10100-2214	280
T.3S., R.46W. S.M.	Cranberry Creek	325-30-10100-2214	10
* T.3S., R.47W. S.M.	Nushagak River	325-30-10100	
	Harris Creek	325-30-10100-2280	1,473
* T.3S., R.48W. S.M.	Nuyakuk River	325-30-10100-2249	1,047
T.3S., R.49W. S.M.	Nuyakuk River	325-30-10100-2249	1,117
T.3S., R.50W. S.M.	Nuyakuk River	325-30-10100-2249	764
* T.4S., R.25W. S.M.	Tributary to Iliamna River	324-10-10150-2402-3025	
	Iliamna River	324-10-10150-2402	421
* T.4S., R.26W. S.M.	Pile River	324-10-10150-2341	
	Iliamna River	324-10-10150-2402	
	Tributary to Iliamna River	324-10-10150-2402-3025	1,448
* T.4S., R.27W. S.M.	Pile River	324-10-10150-2341	340
* T.4S., R.29W. S.M.	Canyon Creek	324-10-10150-2273	238
* T.4S., R.30W. S.M.	Chekok Creek	324-10-10150-2267	278
* T.4S., R.33W. S.M.	Newhalen River	324-10-10150-2207	725
* T.4S., R.34W. S.M.	Pete Andrews Creek	324-10-10150-2195	
	Upper Talarik Creek	324-10-10150-2183	236
T.4S., R.35W. S.M.	Koktuli River	325-30-10100-2202-3080	
	Upper Talarik Creek	324-10-10150-2183	386
T.4S., R.36W. S.M.	Koktuli River	325-30-10100-2202-3080	413
T.4S., R.37W. S.M.	Koktuli River	325-30-10100-2202-3080	
	Tributary to Koktuli R.	325-30-10100-2202-3080-4083	595
T.4S., R.38W. S.M.	Koktuli River	325-30-10100-2202-3080	
	Tributary to Koktuli R.	325-30-10100-2202-3080-4083	496
T.4S., R.39W. S.M.	Tributary to Koktuli R.	325-30-10100-2202-3080-4058	10
T.4S., R.42W. S.M.	Mulchatna River	325-30-10100-2202	91
T.4S., R.43W. S.M.	Mulchatna River	325-30-10100-2202	1,052
T.4S., R.44W. S.M.	Mulchatna River	325-30-10100-2202	2,432
T.4S., R.46W. S.M.	Cranberry Creek	325-30-10100-2214	374

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TOWNSHIP/RANGE	RIVER(S)	ANADROMOUS STREAMS IDENTIFICATION NUMBER	CLOSED ACREAGE**
* T.4S., R.47W. S.M.	Nushagak River	325-30-10100	740
* T.4S., R.48W. S.M.	Nushagak River Nuyakuk River	325-30-10100 325-30-10100-2249	3,278
* T.5S., R.27W. S.M.	Iliamna River Chinkelyes Creek	324-10-10150-2402 324-10-10150-2402-3014	599
* T.5S., R.28W. S.M.	Iliamna River	324-10-10150-2402	301
* T.5S., R.33W. S.M.	Newhalen River	324-10-10150-2207	678
* T.5S., R.34W. S.M.	Newhalen River Pete Andrews Creek	324-10-10150-2207 324-10-10150-2195	512
* T.5S., R.35W. S.M.	Upper Talarik Creek	324-10-10150-2183	349
T.5S., R.36W. S.M.	Lower Talarik Creek	324-10-10150-2167	87
T.5S., R.38W. S.M.	Tributary to Iliamna Lake	324-10-10150-2159	25
T.5S., R.44W. S.M.	Mulchatna River	325-30-10100-2202	1,467
* T.5S., R.45W. S.M.	Mulchatna River	325-30-10100-2202	4,386
* T.5S., R.46W. S.M.	Mulchatna River Cranberry Creek Nushagak River	325-30-10100-2202 325-30-10100-2214 325-30-10100	1,079
* T.5S., R.47W. S.M.	Nushagak River	325-30-10100	3,638
* T.5S., R.48W. S.M.	Nushagak River	325-30-10100	2,438
* T.6S., R.31W. S.M.	Tommy Creek	324-10-10150-2320	32
* T.6S., R.34W. S.M.	Pete Andrews Creek	324-10-10150-2195	116
* T.6S., R.35W. S.M.	Upper Talarik River Tributary to Iliamna Lake	324-10-10150-2183 324-10-10150-2175	280
T.6S., R.36W. S.M.	Tributary to Iliamna Lake Lower Talarik Creek	324-10-10150-2175 324-10-10150-2167	335
T.6S., R.37W. S.M.	Lower Talarik Creek Tributary to Lower Talarik Tributary to Iliamna Lake Tributary to Iliamna Lake	324-10-10150-2167 324-10-10150-2167-3003 324-10-10150-2163 324-10-10150-2159	461
T.6S., R.38W. S.M.	Tributary to Iliamna Lake Tributary to Iliamna Lake Tributary to Iliamna Lake	324-10-10150-2159 324-10-10150-2155 324-10-10150-2149	306
* T.6S., R.45W. S.M.	Mulchatna River	325-30-10100-2202	1,219
* T.6S., R.46W. S.M.	Mulchatna River Nushagak River	325-30-10100-2202 325-30-10100	6,693
T.6S., R.49W. S.M.	Klutuk Creek	325-30-10100-2141	50
T.6S., R.50W. S.M.	Klutuk Creek	325-30-10100-2141	120
T.6S., R.52W. S.M.	Tributary to Kukwuk	325-30-10100-2129-3046-4110	127
T.6S., R.53W. S.M.	Kukwuk River	325-30-10100-2129-3046	438
* T.7S., R.29W. S.M.	Copper River	324-10-10150-2280	65

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TOWNSHIP/RANGE	RIVER(S)	ANADROMOUS STREAMS IDENTIFICATION NUMBER	CLOSED ACREAGE**
* T.7S., R.30W. S.M.	Copper River	324-10-10150-2280	
	Tommy Creek	324-10-10150-2320	276
* T.7S., R.31W. S.M.	Tommy Creek	324-10-10150-2320	
	Copper River	324-10-10150-2280	228
T.7S., R.38W. S.M.	Tributary to Iliamna Lake	324-10-10150-2149	
	Tributary to Iliamna Lake	324-10-10150-2145	123
* T.7S., R.46W. S.M.	Nushagak River	325-30-10100	2,229
* T.7S., R.48W. S.M.	Klutuk Creek	325-30-10100-2141	174
T.7S., R.49W. S.M.	Klutuk Creek	325-30-10100-2141	404
T.7S., R.50W. S.M.	Klutuk Creek	325-30-10100-2141	25
T.7S., R.51W. S.M.	Kenakuchuk Creek	325-30-10100-2129-3040	127
T.7S., R.52W. S.M.	Kenakuchuk Creek	325-30-10100-2129-3040	
	Kukwuk River	325-30-10100-2129-3046	
	Tributary to Kukwuk	325-30-10100-2129-3046-4110	535
T.7S., R.53W. S.M.	Kukwuk River	325-30-10100-2129-3046	
	Kokwok River	325-30-10100-2129	389
* T.8S., R.30W. S.M.	Kokhanok River	324-10-10150-2240	
	Copper River	324-10-10150-2280	178
* T.8S., R.31W. S.M.	Kokhanok River	324-10-10150-2240	
	Copper River	324-10-10150-2280	119
* T.8S., R.33W. S.M.	Tributary to Iliamna Lake	324-10-10150-2196	14
* T.8S., R.46W. S.M.	Nushagak River	325-30-10100	1,247
* T.8S., R.47W. S.M.	Nushagak River	325-30-10100	3,585
T.8S., R.51W. S.M.	Kokwok River	325-30-10100-2129	160
T.8S., R.52W. S.M.	Kokwok River	325-30-10100-2129	
	Kenakuchuk Creek	325-30-10100-2129-3040	
	Kukwuk River	325-30-10100-2129-3046	833
* T.8S., R.53W. S.M.	Kokwok River	325-30-10100-2129	119
T.8S., R.54W. S.M.	Pike Creek	325-30-10100-2031-3118-4062	36
* T.8S., R.55W. S.M.	Pike Creek	325-30-10100-2031-3118-4062	91
* T.9S., R.33W. S.M.	Tributary to Iliamna Lake	324-10-10150-2196	14
T.9S., R.34W. S.M.	Dennis Creek	324-10-10150-2182	171
T.9S., R.35W. S.M.	Tributary to Iliamna Lake	324-10-10150-2162	
	Tributary to Belinda Creek	324-10-10150-2156-3005-4007	101
T.9S., R.36W. S.M.	Tributary to Iliamna Lake	324-10-10150-2162	
	Belinda Creek	324-10-10150-2156	204
* T.9S., R.48W. S.M.	Nushagak River	325-30-10100	1,979
* T.9S., R.49W. S.M.	Nushagak River	325-30-10100	461
* T.9S., R.50W. S.M.	Kokwok River	325-30-10100-2129	530
* T.9S., R.51W. S.M.	Kokwok River	325-30-10100-2129	468

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TOWNSHIP/RANGE	RIVER(S)	ANADROMOUS STREAMS IDENTIFICATION NUMBER	CLOSED ACREAGE*
T.9S., R.52W. S.M.	Kokwok River	325-30-10100-2129	120
T.9S., R.53W. S.M.	Iowithla River	325-30-10100-2101	109
* T.9S., R.54W. S.M.	Iowithla River Muklung River	325-30-10100-2101 325-30-10100-2031-3028	221
T.9S., R.55W. S.M.	Muklung River	325-30-10100-2031-3028	178
* T.9S., R.57W. S.M.	Agulowak River	325-30-10100-2031-3118	138
T.10S., R.31W. S.M.	Dream Creek	324-10-10150-2196-3033	113
* T.10S., R.32W. S.M.	Tributary to Iliamna Lake	324-10-10150-2196	94
T.10S., R.35W. S.M.	Tributary to Belinda Creek Tributary to Belinda Creek Belinda Creek	324-10-10150-2156-3005-4007 324-10-10150-2156-3005 324-10-10150-2156	371
T.10S., R.36W. S.M.	Belinda Creek Tributary to Belinda Creek	324-10-10150-2156 324-10-10150-2156-3005	247
* T.10S., R.37W. S.M.	Pecks Creek	324-10-10150-2136	193
* T.10S., R.38W. S.M.	Pecks Creek	324-10-10150-2136	262
* T.10S., R.39W. S.M.	Pecks Creek Kvichak River	324-10-10150-2136 324-10-10150	490
* T.10S., R.40W. S.M.	Kvichak River Pecks Creek Kvichak River	324-10-10150 324-10-10150-2136 324-10-10150	1,250
* T.10S., R.41W. S.M.	Kvichak River	324-10-10150	727
* T.10S., R.49W. S.M.	Nushagak River Kokwok River	325-30-10100 325-30-10100-2129	4,236
* T.10S., R.50W. S.M.	Nushagak River Kokwok River	325-30-10100 325-30-10100-2129	1,636
T.10S., R.53W. S.M.	Iowithla River	325-30-10100-2101	295
* T.10S., R.54W. S.M.	Muklung River	325-30-10100-2031-3028	171
* T.10S., R.55W. S.M.	Muklung River Wood River	325-30-10100-2031-3028 325-30-10100-2031	163
* T.11S., R.41W. S.M.	Kvichak River	324-10-10150	394
T.11S., R.42W. S.M.	Kvichak River	324-10-10150	816
* T.11S., R.43W. S.M.	Kvichak River	324-10-10150	494
* T.11S., R.44W. S.M.	Kvichak River	324-10-10150	987
* T.11S., R.49W. S.M.	Nushagak River	325-30-10100	28
* T.11S., R.50W. S.M.	Nushagak River	325-30-10100	2,504
* T.11S., R.55W. S.M.	Wood River	325-30-10100-2031	1,046
* T.12S., R.44W. S.M.	Kvichak River	324-10-10150	1,421
* T.12S., R.45W. S.M.	Kvichak River	324-10-10150	2,220

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TOWNSHIP/RANGE	RIVER(S)	ANADROMOUS STREAMS IDENTIFICATION NUMBER	CLOSED ACREAGE**
* T.12S., R.50W. S.M.	Nushagak River	325-30-10100	10,441
T.12S., R.55W. S.M.	Wood River	325-30-10100-2031	2,876
* T.13S., R.45W. S.M.	Kvichak River	324-10-10150	1,329
* T.13S., R.46W. S.M.	Kvichak River	324-10-10150	2,672
* T.13S., R.50W. S.M.	Nushagak River	325-30-10100	980
* T.13S., R.51W. S.M.	Nushagak River	325-30-10100	1,250
* T.13S., R.53W. S.M.	Nushagak River	325-30-10100	2,935
* T.13S., R.54W. S.M.	Nushagak River	325-30-10100	5,850
* T.13S., R.55W. S.M.	Nushagak River Wood River	325-30-10100 325-30-10100-2031	9,700
* T.13S., R.56W. S.M.	Nushagak River	325-30-10100	112
* T.14S., R.46W. S.M.	Kvichak River	324-10-10150	4,603
* T.14S., R.50W. S.M.	Nushagak River	325-30-10100	809
* T.14S., R.51W. S.M.	Nushagak River	325-30-10100	1,600
* T.14S., R.52W. S.M.	Nushagak River	325-30-10100	1,337
* T.14S., R.53W. S.M.	Nushagak River	325-30-10100	5,151
* T.15S., R.51W. S.M.	Nushagak River	325-30-10100	1,425
* T.15S., R.52W. S.M.	Nushagak River	325-30-10100	2,364
* T.15S., R.53W. S.M.	Nushagak River	325-30-10100	1,002
T.45S., R.69W. S.M.	Sandy River	315-12-10100	193
T.45S., R.70W. S.M.	Sandy River	315-12-10100	562
T.45S., R.71W. S.M.	Sandy River	315-12-10100	468
T.46S., R.68W. S.M.	Sandy River	315-12-10100	588
T.46S., R.69W. S.M.	Sandy River	315-12-10100	254
T.46S., R.70W. S.M.	Sandy River	315-12-10100	135
T.46S., R.71W. S.M.	Sandy River Tributary to Bear River Bear River	315-12-10100 315-11-10200-2009 315-11-10200	419
T.46S., R.72W. S.M.	Bear River	315-11-10200	54
T.47S., R.70W. S.M.	Tributary to Bear River	315-11-10200-2009	87
T.47S., R.71W. S.M.	Tributary to Bear River Bear River	315-11-10200-2009 315-11-10200	381
T.47S., R.72W. S.M.	Bear River	315-11-10200	36
T.48S., R.70W. S.M.	Bear River	315-11-10200	3
T.48S., R.71W. S.M.	Bear River	315-11-10200	102
T.49S., R.70W. S.M.	Bear River	315-11-10200	156

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TOWNSHIP/RANGE	RIVER(S)	ANADROMOUS STREAMS IDENTIFICATION NUMBER	CLOSED ACREAGE**
T.49S., R.71W. S.M.	Bear River	315-11-10200	3
* T.49S., R.78W. S.M.	Sapsuk River Caribou River	313-30-10140-2013 313-30-10140	467
* T.49S., R.79W. S.M.	Caribou River	313-30-10140	43
T.50S., R.76W. S.M.	Lefthead River	313-30-10140-2013-3007	94
T.50S., R.77W. S.M.	Sapsuk River Lefthead River	313-30-10140-2013 313-30-10140-2013-3007	345
* T.50S., R.78W. S.M.	Sapsuk River Peterson Creek Caribou River	313-30-10140-2013 313-30-10140-2013-3006 313-30-10140	796
* T.50S., R.79W. S.M.	Caribou River	313-30-10140	171
T.51S., R.76W. S.M.	Lefthead River	313-30-10140-2013-3007	247
T.51S., R.77W. S.M.	Sapsuk River	313-30-10140-2013	338
T.51S., R.78W. S.M.	Peterson Creek Caribou River	313-30-10140-2013-3006 313-30-10140	309
T.51S., R.79W. S.M.	Caribou River	313-30-10140	276
T.51S., R.80W. S.M.	Caribou River	313-30-10140	3
T.52S., R.76W. S.M.	Sapsuk River	313-30-10140-2013	14
T.52S., R.80W. S.M.	Caribou River	315-30-10140	368
T.52S., R.81W. S.M.	Caribou River	315-30-10140	76
	TOTAL ACREAGE ENCOMPASSED BY STREAM MINERAL CLOSURE		213,697*

* Acreage totals for townships include some acreage of Native selected or conveyed lands.

** Acreage figures are estimates only, though care was taken to make them as accurate as possible. See Attachment B for the methology of this acreage estimation.

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ATTACHMENT 1.1

BRISTOL BAY AREA PLAN
STREAM CLOSURE ACREAGE ESTIMATION

The Bristol Bay Area Plan (BBAP) calls for selected stream closures to new mineral entry. The total acreage encompassed by these stream closures is estimated at 213,697 acres. This acreage estimation was arrived at through the following methods.

The active stream channels (as defined by the BBAP) of designated anadromous streams identified for closure by the BBAP were mapped at 1:63,360.

Acreage estimations for large and braided streams (i.e. Nushagak, Mulchatna, Nuyakuk and Kvichak rivers, etc.) were calculated on a CALCOMP 9000 digitizer. Area was calculated in square miles and converted to acres.

Acreage estimations for smaller streams were determined by calculating stream length on a CALCOMP 9000 digitizer and multiplying length by an average stream width of 100' plus a 100' buffer on either side of the stream for a total 300' stream corridor. Area was calculated in square miles and converted to acres.

Acreage was compiled by individual township/range and also totaled by USGS quad map.

Native selected and conveyed lands within the active stream channel and upland buffer areas were separated out from the total acreage figure compiled for each township by manual calculation of the affected acreage at a 1:63,360 scale. An asterisk (*) is placed next to those townships that contain native selected and conveyed lands.

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ATTACHMENT 2

JUSTIFICATION FOR STREAM CLOSURES

BACKGROUND:

FISH AND WILDLIFE USE

The Bristol Bay salmon fishery is, and historically has been, the most valuable economic resource in the Bristol Bay region; providing a major portion of all the salmon harvested in the State of Alaska and the world annually. Bristol Bay area residents rely heavily on this salmon resource to support their livelihood and economy through commercial, sport, and subsistence fishing activities. The existence and future success of the Bristol Bay salmon fishery depends on the maintenance of anadromous stream habitat for salmon spawning and rearing. Essential conditions for successful salmonid spawning, egg, and fry development are clear, cool, well-oxygenated water, and gravel that is free of sediment, highly permeable, and stable. Salmon are a renewable resource and the continued propagation and production of Bristol Bay salmon for commercial, sport, and subsistence harvest constitutes a significant surface use of stream waters and stream bed gravel in the Bristol Bay area. Through maintenance of water quality, stream habitat, and fishery management practices, the Bristol Bay salmon fishery should continue to prosper in the future and contribute to the regional and state economy. Other fish, primarily rainbow trout, arctic char, and grayling, are of major importance to the region's sport fishery.

COMMERCIAL SALMON HARVEST

The Bristol Bay commercial salmon fishery dates back to 1884, and remains today as the basic factor in the culture and economy of the area. The Bristol Bay Area Plan study area includes all of the Bristol Bay, Alaska Peninsula, and Chignik fishery management units (ADF&G).

Five species of Pacific salmon are indigenous to the Bristol Bay study area with sockeye salmon being most important commercially. The average ex-vessel value for salmon catches (all species) in the entire Bristol Bay study area (1977-1982) have exceeded $150 million annually with the first wholesale value surpassing $250 million in 1982. In 1983, a record commercial catch of more than 39 million sockeye salmon from the Bristol Bay fisheries management unit and the north side of the Alaska Peninsula was recorded with an ex-vessel value in excess of $145 million for that species alone.

An estimated 3,000 limited entry fishing permits were issued for the Bristol Bay and Alaska Peninsula purse seine, drift gill net, and set gill net salmon fisheries in 1982. Approximately 67% of these licensed gear holders are Alaska residents, and 70% of these are Bristol Bay residents. More than 7,700 commercial fishermen are employed in the fishery during the season. In addition, twelve shore-based canneries in Bristol Bay employ more than 2,000 cannery workers each season with floating processors employing an additional 700 workers. In addition, air freighting of fresh salmon, for

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processing elsewhere, is also a substantial enterprise, particularly during high production years. On the average, more than 10,000 people are seasonally employed by the Bristol Bay salmon fishery.

RECREATION/SPORT FISHING

The Bristol Bay study area ranks among the finest sport fishing and hunting areas in the world. Recreation, including sport fishing, has been recognized as a component of the Bristol Bay economy for over 50 years. In recognition of the region's exceptional rainbow trout fishery, the Alaska Board of Fisheries has designated the Kvichak River (from the mouth of the Alagnak River) and the Iliamna Lake drainage as a Wild Rainbow Trout Area. Within this drainage, Lower Talarik Creek, Upper Talarik Creek, Pete Andrew Creek, Newhalen River, Copper River, Gibraltar River, Dream Creek, and Belinda Creek are world-renowned rainbow trout streams. At present, the recreational industry in the Bristol Bay area is comprised of three components: lodges, guides, and air taxi operators. Most air taxi operators draw their business from the lodges and guides. Approximately 50 to 60 lodges operated in Bristol Bay during 1983. Most of these lodges are geared for sport fishing activities. Approximately two-thirds of the lodge clients were foreign, with the majority of the remaining clients being non-Alaskans. The estimated cost for lodging and fishing at a typical Bristol Bay fishing lodge ranges from $1,500 to $3,500 per person, per week (Nebesky 1984). The 1982 State Guide Register recorded 189 sport fishing and hunting guides in the Bristol Bay area. About 50 registered fishing guides work for the lodges and another 25 operate fly-out float fishing trips on Bristol Bay rivers. Guided fishing trips in Bristol Bay are estimated to average $1,400 per person, per trip (Nebesky 1984). Nonguided independent fishing trips are becoming increasingly popular in Bristol Bay. An estimated 750 to 1,000 persons (mostly Alaskans) take nonguided float-fishing trips in Bristol Bay each year. The majority of the float trips are taken on the Mulchatna, Nushagak, Nuyakuk, Koktuli, Chilikadrotna, Copper, Alagnak (Branch), and Gibraltar rivers, and the Wood River-Tikchik River System. The local economic affect of nonguided fishing tours accrues primarily to air taxi operators (Nebesky 1984). Overall, the Bristol Bay recreation industry, of which sport fishing is a major component, produces in excess of $25 million annually. Of this amount, an estimated $6.7 million is earned by Bristol Bay residents, $16.3 million is earned by Alaskans outside of Bristol Bay, and $2 million is tied to nonresident wages (Nebesky 1984).

SUBSISTENCE SALMON HARVEST

The subsistence harvest of fish and wildlife is essential to the way of life in Bristol Bay communities, regardless of the birthplace, ethnic origin, or economic status of the area residents. Salmon are the most important fish and wildlife resource harvested for subsistence by the region's residents. The subsistence harvest of salmon (all species) in the Bristol Bay study area averages about 176,000 salmon per year (1973-1982). In 1982, an estimated 1,000 subsistence permit holders harvested more than 169,000 salmon for personal consumption in the Bristol Bay study area. Taking into consideration the average weights of the different salmon species and the

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percentage of usable food weight per salmon, the 1982 subsistence harvest figures translate into approximately 821 pounds of dressed out salmon per family or subsistence permit holder in the Bristol Bay study area.

The behavioral, social, and cultural values associated with the subsistence harvest cannot be measured in standard monetary terms. However, an estimation can be made of the local food replacement cost of the subsistence salmon harvest if the harvest had to be replaced with similar food or a protein equivalent purchased and shipped in from Anchorage or Dillingham. Methodology used in determining the local food replacement cost of the subsistence harvest is still being refined. Preliminary estimates for the local food replacement cost of the 1982 subsistence salmon harvest range from $2 to $4 million.

INSTREAM MINING

At present, instream placer mining, when compared with fishery resources, is a minor component of the Bristol Bay economy. Annual operating permits were granted for only eight placer operations within the entire Bristol Bay study area in 1983. Only one of these eight placer operations (Bonanza Creek) is located within the general area encompassed by the proposed stream closures. The Bonanza Creek drainage is not closed to new mineral entry. The estimated 1982 gold production of the eight placer operations within the Bristol Bay study area is 9,500 ounces, valued at approximately $3.8 million (T. Bundtzen, DGGS, 1983, Pers. Comm.). Nebesky et al. (1983) estimates that placer mining operations in the Bristol Bay study area seasonally employed about 100 persons in 1982, a peak year for mining and gold prices. Most all of the mining activity occurred in the northwestern portion of the BBAP study area.

Historically, many areas in the Bristol Bay region have been subject to placer mining exploration and mineral discovery. The majority of this placer activity has occurred on the rivers and streams around the eastern half of Iliamna Lake, the upper Nushagak and Mulchatna river drainages, the south side of the Alaska Peninsula, and west of the Ahklun Mountains. Many deposits have been recorded. (Cobb, 1972 and Cobb et.al., 1972).

The likelihood of renewed interest in placer deposits in the Nushagak and Mulchatna river drainages and the streams around the eastern half of Iliamna Lake is good. As more of Alaska's mineral resources are explored and the readily road accessible mineralized areas are developed, these areas in Bristol Bay are likely to be re-explored. Re-newed interest would probably occur here due to knowledge of the historic deposits, favorable geology and mineral terranes. Recently, Anaconda Minerals Company announced a new precious metal hardrock mineral discovery at Johnson River, east of Iliamna Lake in the Cook Inlet drainage. Native corporations in the region, particularly Bristol Bay Native Corporation, have been assessing the mineral resources of their lands in these areas. This and other mineral activity in the area is likely to draw additional activity due to these favorable results.

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EFFECTS OF INSTREAM MINING

The development of mining claims within the active stream channel of an anadromous stream creates a serious use conflict and could jeopardize the commercial, sport, and subsistence harvest of salmon and the overall economic and sociocultural structure of the Bristol Bay region. In general, instream placer mining can seriously degrade anadromous stream habitat by producing excessive sediment, increasing turbidity, changing pH, adding toxic heavy metals to stream water, and altering stream channels and stream flows. The effects of placer mining immediately adjacent to streams are similar to other land disturbance activities (i.e., logging, agriculture, vegetation removal, road construction) that can introduce unnaturally high levels of sediment into stream environments. Existing literature contains many studies, reports, and documents on the effects of increased sediment loads on salmonids, food chain components, and on aquatic ecosystems. Properly designed and maintained settling ponds and recycling systems when utilized, may minimize some impacts of sedimentation on aquatic life. The major conclusions reached by investigators studying the effects of placer mining and sedimentation on aquatic life and stream systems are summarized by Madison (1981) as follows:

1. Effects on Fish Life

- Temporary or permanent destruction or modification of spawning beds that can result in failure to spawn or complete or partial mortality of eggs, alevins, or fry. The primary causes are: Reduction of dissolved oxygen, increase in the percentage of silt and sand in the spawning gravel, reduction in intergravel flow rates, scouring of the spawning gravels subsequent to spawning, removal of stream gravels, or complete covering of the spawning beds with sediment;

- Loss of available food supply due to reductions in production at the lower trophic levels (plant life and benthic invertebrates);

- Interference with the sight-dependent feeding habits of salmonids;

- Obliteration of hiding or living areas in gravel by clogging of the interstices with fine sediment, or by reduction of pool areas;

- Short-term exposure to very large concentrations of suspended sediment that can cause fish mortality through damage to the gill structure; and

- Avoidance of normal spawning areas (even at relatively low turbidity) and displacement to cleaner tributaries or other sections of a stream.

2. Effects on Aquatic Plant Life

- Reduction in photosynthetic activity and consequent reduction in growth of algae and macrophytes which form the basis of the food chain for salmon and other freshwater fish;

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- Smothering of plant life inhabiting the stream bottom; and

- Increase in the mobility of the substrate.

3. Effects on Benthic Invertebrates

- Reduction in the abundance and diversity of benthos as a result of reduction in available food supply (plant life), increased drift and susceptibility to predation, clogging of the feeding apparatus by fine sediments, and loss of available or suitable substrate habitat; and

- Changes in community composition from clean-water species to species more adaptable to higher sediment levels but possibly less suitable as fish-food organisms.

4. Physical Effects on the Hydrologic System

- Increased turbidity and resultant reduction in light penetration;

- Alteration of channels, including changes in slope, stream velocity, discharge, depth and width, scouring characteristics, stream length, pool-riffle ratio, ground-water/surface-water relationships, ground-water recharge characteristics, and water temperature; and

- Changes in the stream bottom material, including changes in the particle-size composition which may change the rate of intergravel water flow, deposition of fine material and gravel on riffle areas, and changes in bedload movement.

Recent studies completed by researchers at the University of Alaska, Fairbanks (LaPerriere et al., 1983 and Van Nieuwenhuyse, 1983) have substantiated many of these same effects on freshwater habitats in Alaska. In brief, Alaskan researchers have found that mining-induced sedimentation and turbidity results in reduced light penetration, reduced production of plant material, and ultimately a decrease in the production and abundance of fish. In Birch Creek, on anadromous stream heavely impacted by mining, all fish, insect life, and even most algae had been eliminated as a result of mining. Mining-induced turbidity also adversely effects the human use of clear-water habitat for sport fishing, river floating, canoeing, and other recreational activities.

JUSTIFICATION FOR MINERAL CLOSING ORDER:

Title 38 of the Alaska Statutes addresses the management of public lands of the State of Alaska. Section 38.05.185 states:

> "State land may not be closed to mining or mineral location unless the commissioner makes a finding that mining would be incompatible with significant surface uses on the state land. State land may not be restricted to mining under lease unless the commissioner determines that the potential use conflicts on state land require

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that mining be allowed only under written lease issued under AS 38.05.205 or the commissioner has determined that the land was mineral in character at the time of state selection."

Section 38.05.185 provides further:

"The determination required under this subsection shall be made in compliance with land classification orders and land use plans developed under AS 38.05.300."

A land use plan such as the Bristol Bay Area Plan is an appropriate forum for classifying state lands and designating specific areas for mineral closures or leasehold locations when these areas meet the criteria set forth in Section 38.05.185. (See also 11 AAC 55, Land Planning and Classification Regulations)

The Bristol Bay Area Plan recognizes continued salmon propagation and production as a significant surface use of state lands in Bristol Bay. The plan also recognizes instream placer mining as conflicting with the continued propagation and production of Bristol Bay salmon and therefore requires closure of selected anadromous streams to new mineral entry. The plan specifically states the following:

The designated anadromous portion of the following streams (designated pursuant to AS 16.05.870) and any state uplands 100 feet from the ordinary high watermark (on both sides of the stream) including islands which are state selected, patented or tentatively approved and excluding islands of other ownership will be closed to new mineral entry in accordance with AS 38.05.185:

Nushagak River Drainage
- Nushagak River
- Wood River
- Muklung River (Upper 15 Miles)
- Iowithla River (Upper 15 Miles)
- Kokwok River
- Kenakuchuk Creek
- Kukwuk River
- 325-30-10100-2129-3046-4110 tributary to Kukwuk River
- Klutuk Creek
- Cranberry Creek
- Harris Creek
- Nuyakuk River
- King Salmon River
- 325-30-10100-2435-3100 tributary to King Salmon River
- 325-30-10100-2435-3116 tributary to King Salmon River
- 325-30-10100-2435-3116-4011 tributary to King Salmon River
- 325-30-10100-2435-3130 tributary to King Salmon River
- Mulchatna River
- Old Man Creek
- Koktuli River

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325-30-10100-2202-3080-4058 tributary to Koktuli River
325-30-10100-2202-3080-4083 tributary to Koktuli River
Keefer Creek
325-30-10100-2202-3420 tributary to Mulchatna River
Chilchitna River
Nikadavna Creek
Chilikadrotna River

Kvichak/Naknek Drainage
Kvichak River
Pecks Creek
324-10-10150-2145 tributary to Iliamna Lake
324-10-10150-2149 tributary to Iliamna Lake
324-10-10150-2155 tributary to Iliamna Lake
324-10-10150-2159 tributary to Iliamna Lake
324-10-10150-2163 tributary to Iliamna Lake
Lower Talarik Creek
324-10-10150-2167-3003 tributary to Lower Talarik Lake
324-10-10150-2175 tributary to Iliamna Lake
Upper Talarik Creek
Pete Andrews Creek
Newhalen River
Chulitna River
Chekok Creek
Canyon Creek
Pile River
Iliamna River
324-10-10150-2402-3025 tributary to Iliamna River
Chinkelyes Creek
Tommy Creek
Copper River
Kokhanok River
324-10-10150-2196 tributary to Iliamna Lake
Dream Creek
Dennis Creek
324-10-10150-2162 tributary to Iliamna Lake
Belinda Creek
324-10-10150-2156-3005 tributary to Belinda Creek
324-10-10150-2156-3005-4007 tributary to Belinda Creek

North Alaska Peninsula Drainages
Sandy River
Bear River
315-11-10200-2009 tributary to Bear River
Caribou River
Sapsuk River
Lefthead River
Peterson Creek

These streams are further depicted in Attachment 3, "An Atlas to the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes, 64 Anadromous Streams Closed to New Mineral Entry."

Mining has been previously found to be incompatible with several different types of land uses determined to be significant surface uses of state land. State park and recreation areas, residential subdivisions, river corridors, agricultural areas, and disposal of state land for remote settlement are some examples where mining has been determined to be incompatible with a significant surface use of state land. The propagation and production of salmon is also a significant use of state lands in Bristol Bay. This surface use activity is the mainstay of the Bristol Bay economy and is also a substantial contributor to the state economy. Instream placer mining would create serious use conflicts in anadromous streams and jeopardize the overall productivity of anadromous streams in Bristol Bay, and ultimately, the economy of the Bristol Bay region and the livelihood of area residents.

The conflict between fisheries and mining was recognized by both the state legislature and the U.S. Congress when they established parks and refuges in the region. Mineral entry is incompatible with the fish, wildlife, subsistence, and recreation use of Wood-Tikchik State Park (see AS.41.21.161). All federal public lands in Togiak, Becharof, and Alaska Peninsula National Wildlife Refuges, Lake Clark National Park and Preserve, Katmai National Park and Preserve and Aniakchak National Monument and Preserve are closed to new mineral entry under the Alaska National Interest Lands Conservation Act (or earlier federal legislation) as it was viewed as incompatible with protection of fish and wildlife habitats and populations. Many of the streams to be closed by this order originate within these parks and refuges. Providing sufficient protection to these fishery resources on state lands outside the parks and refuges is critical to protection of these resources within them.

Only the anadromous streams and any islands contained therein, which would be in highest conflict with instream placer mining activities, are to be closed to new mineral entry. High conflict was determined by a streams' juxtaposition to known and verified mineral terranes within the Bristol Bay study area. Existing mining claims are not affected by the stream closures. The closure of the above mentioned anadromous streams encompass an estimated 213,697 acres of state lands. Native conveyed lands within the active stream channel of an anadromous stream designated by this order are not subject to the mineral closure, as these lands are privately owned.

The 1982 and 1983 commercial sockeye salmon harvest and escapement data for the Bristol Bay and North Alaska Peninsula Fishery Management District show that approximately 75% of the commercial sockeye salmon harvest and 72% of the sockeye salmon escapement originates or spawns in the Nushagak/Mulchatna, Kvichak/Iliamna, Sandy, Bear, or Caribou River drainages where mineral closures have been recommended by the Bristol Bay Area Plan. By closing that portion of the Bristol Bay study area to new mineral entry where the most conflict between fishery production and instream mining would occur, through other plan provisions requiring leasehold location mining,

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and through enforcement of existing statutes and regulations, protection can be provided to a large portion of the Bristol Bay sockeye salmon run.

Existing state and federal water quality regulations and standards were considered inadequate to guarantee the continued propagation and production of the salmon and other fish resources in the stream waters in the Bristol Bay area. The past and present lack of compliance with and enforcement of these water quality standards in this area and other areas in the state were some of the factors considered during the development of the Bristol Bay Area Plan. The existing standard for turbidity, a measure of suspended sediment, allows for levels of sediment which some experts indicate is detrimental to salmon and their eggs and fry. Also, these levels create conditions which make adequate and effective fishery management extremely difficult due to the inability to visually determine escapement. Alaska Statute 16.05.870 gives the Commissioner of Fish and Game authority to regulate activities within designated anadromous streams. Within the 64 streams designated for closure in this order, sufficient protection of fish and game resources (as required in AS 16.05.870 (d)) would likely preclude mining in these areas after a mining claim has already been filed. Actual stream closings more effectively and efficiently achieves the level of fisheries protection required on these 64 streams. The result of these analyses was to close to new mineral entry those streams where highest conflict between the salmon fishery and mining would occur.

In closing, the best interest of the State of Alaska and its residents are served by the closure of the anadromous streams, as identified in the Bristol Bay Area Plan and further depicted in Attachment 3, titled "An Atlas to the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes, 64 Anadromous Streams Closed to New Mineral Entry," to new mineral entry under the locatable mineral leasing and mining laws of the State of Alaska.

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JUSTIFICATION FOR STREAM CLOSURES
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